

Species and diagnosis of the Families and Genera of Solenogastres (Mollusca)

Especies y diagnosis de las Familias y Géneros de los Moluscos Solenogastros

Óscar GARCÍA-ÁLVAREZ* and Luitfried v. SALVINI-PLAWEN**

Recibido el 23-V-2005. Aceptado el 15-X-2007

ABSTRACT

Although Solenogastres molluscs are not rare animals, knowledge of this group is very incomplete since information on its biology, diversity and geographical distribution is still limited and unequal. Over the last few decades, however, research on their morphological and organizational diversity has increased considerably, and the systematics has been modified. For this reason, this contribution summarizes the diagnoses of all families and genera, and compiles a list of the species with information about their holotype, distribution and the most recent literature. The holotype of *Anamenia heathi* Leloup, 1947, is designated as neotype of *Neomenia gorgonophila* Kowalevsky, 1880.

RESUMEN

Aunque los moluscos solenogastros no son animales raros, el conocimiento que se tiene sobre este grupo es muy incompleto, ya que las informaciones sobre su biología, diversidad y distribución geográfica son aún limitadas y desiguales. No obstante, en las últimas décadas las investigaciones sobre su diversidad morfológica y organizativa se han incrementado notablemente y su sistemática ha sufrido diversas modificaciones. Por ello en este artículo se hace un compendio de las diagnosis de todas las familias y los géneros y se recopila un listado de las especies con información sobre su holotipo, distribución y la bibliografía más reciente. Se designa el holotipo de *Anamenia heathi* Leloup, 1947, como neotipo de *Neomenia gorgonophila* Kowalevsky, 1880.

KEY WORDS: Mollusca, Solenogastres, diagnosis, families, genera, species.

PALABRAS CLAVE: Mollusca, Solenogastres, diagnosis, familias, géneros, especies.

INTRODUCTION

The Solenogastres are a class of molluscs of which our knowledge is fairly incomplete. Despite progress in researching this class over the last few decades, information on their diversity and geographical distribution is

extremely limited and uneven, and data on their biology continue to be scarce. Solenogastres are not, however, a rare animal group since they are present on most marine bottoms, from coastal areas to great depths.

* Department of Animal Biology, Faculty of Biology, University of Santiago de Compostela, E-15782 Santiago de Compostela. Spain. E-mail: baoscar@usc.es

** Zoologie, Universität Wien, Althanstraße 14, A-1090 Wien, Austria.

Study of the Solenogastres commenced in the last decades of the 19th century when TULLBERG, in 1875, described the first species *Neomenia carinata*, collected on the Swedish West coast. In the initial years of research, the number of species described increased considerably, thanks to the meticulous work carried out and improvements to the methods used for collecting samples at great depths. Most of the new species came from samplings carried out in the course of scientific expeditions conducted at that time and from marine research in the vicinity of Biological Stations.

The history of research on this molluscan class may be divided into three large periods. In the initial period, from the end of the 19th century to the third decade of the 20th century, numerous works were published on Solenogastres, by authors such as Danielssen, Heath, Hubrecht, Koren, Kovalevsky, Nierstrasz, Marion, Odhner, Pruvot, Thiele and Wirén, *inter alia*. They described new species, in many cases from the European coastline, and also studied numerous material from the various scientific expeditions conducted in seas, unexplored until that time. Thus NIERSTRASZ (1902) studied the Solenogastres from the Siboga expedition to the archipelagos of Southwest Asia; THIELE (1902, 1906) described species collected by Valdivia in the Indian Ocean; PELSENEER (1903), NIERSTRASZ (1908), THIELE (1913a) described samples taken during various Antarctic expeditions; and THIELE (1911, 1932) compiled the Solenogastres from Arctic expeditions. Other studies were also conducted on anatomy (THIELE 1894; NIERSTRASZ, 1905; HEATH 1905, 1914), physiology (PRUVOT 1890b; HEATH 1904a, 1908), behaviour (HEATH 1904b) and larval development (PRUVOT 1890a, 1892). Compilations were published by SIMROTH (1893), NIERSTRASZ (1909), THIELE (1913b) and HOFFMANN (1929-1930).

Over the following three decades, research on Solenogastres was less productive, but several results were of special interest, such as those dealing with the anatomy, physiology and development (BABA 1938, 1940a, 1940b,

1951; HOFFMAN 1947/1949; LELOUP 1950; THOMPSON 1960; SCHWABL 1963).

At the end of the 1960's, the 20th century passed into a third period. Salvini-Plawen undertook new studies on Solenogastres and, a few years later, Scheltema started her work on this class of molluscs. These authors described numerous species, making contributions on anatomy, systematics and behaviour of the group and carrying out modern synopses on their organization (SALVINI-PLAWEN 1971, 1972, 1985; SCHELTEMA 1988, 1993; SCHELTEMA, TSECHERKASSKY AND KUZIRIAN, 1994). SALVINI-PLAWEN (1967) compiled diagnoses of known genera and constructed keys for identifying families and genera. Some years later, he published the monograph on "Antarktische und subantarktische Solenogastres" (SALVINI-PLAWEN 1978), on which the current classification is based. In the course of the past decade, new researchers have joined Salvini-Plawen and Scheltema in the study of this class of molluscs, conducting works on morphological and organizational diversity, based on the description of new species, contributing much data on their biology, distribution and development.

In the past three decades since the publication by SALVINI-PLAWEN (1967) of the key for identifying the genera and the compilation of their diagnoses, knowledge on the diversity of the class has increased substantially. For this reason, this contribution provides a synopsis of the diagnoses of the families and genera, and compiles the species with information about the holotype, distribution and most recent literature.

SYSTEMATICS

To date, the class Solenogastres includes about 250 described species. The current suprageneric classification (SALVINI-PLAWEN, 1978; HANDL AND TODT, 2005) is based on the characters of the mantle cover with cuticle and sclerites, as well as on the types of the radula (monoserial, biserial, distichous, tetraserial, polyserial/polystichous) and

on the paired ventral foregut glandular organs associated with it.

Characters of the sclerites

Sclerites are found inside the cuticle or projecting out of the same. The size of the sclerites varies from micrometric sizes to 3 or 4 mm in length, and there are two basic types that are related to the thickness of the cuticle. The thin cuticles, particular to the more primitive Solenogastres, correlate with smooth or striated scales arranged in one layer, whereas thick cuticles, characteristics of the more evolved Solenogastres, correlate with acicular sclerites, which are arranged in two or more layers. In the order Cavibelonia, sclerites are hollow aciculars with thick or thin walls, arranged both radially and tangentially. The latter may be located in a single layer, and thus are arranged obliquely, or may form two or more layers of sclerites interlacing among themselves almost perpendicularly. These are embedded in the cuticle arranged so as to form very small angles with the mantle epithelium (termed as skeletal by SCHELTEMA, 1999; SCHELTEMA and SCHANDER, 2000). In addition, Sterrofustia and Cavibelonia may have sclerites with a hooked distal end and/or with an asymmetrically flattened distal portion, and in Cavibelonia sclerites may occur with a distally asymmetric axe or harpoon shape (termed as "captate" by ARNOFSKY, 2000).

Characters of the radula

Solenogastres normally possess a radula, although in many species, this is regressive. The radular apparatus comprises a radula with a variable number of transversal rows of different shaped teeth, a cellular reinforcement and an operative musculature. Groups of odontoblasts in the dorsal radular sheath secrete radula teeth; there is no true radular membrane, rather a kind of pre-ribbon of a material identical to that of the teeth (WOLTER, 1992). Used teeth are lost or retained in the anterolateral or ventral radular sac.

Depending on the shape and arrangement of the teeth, various types

of radula may be differentiated (SALVINI-PLAWEN, 1978; HANDL, 2002):

- Monoserial type: each row formed by one tooth or one more or less wide plate with a variable denticulation, characteristic of the genera *Dondersia*, *Nematomenia*, *Alexandromenia* and others.

- Biserial type: each row formed by two teeth or denticulated plates, characteristic of the family Simrothiellidae; the pectinated radula, very characteristic of the genus *Anamenia* may be included within this group.

- Distichous type: each row formed by a pair of hook-shaped teeth, characteristic of *Wirenia*, *Pruvotina*, *Epimenia*.

- Tetraserial type: each row formed by four teeth, characteristic of the genus *Imeroherpia*.

- Polystichous/Polyserial type: each row with many denticles/teeth, typical of the genera *Proneomenia* and *Dorymenia*.

Characters of the ventral foregut glandular organs

The ventral foregut glandular organs may be absent (Hemineniidae, Neomeniidae and *Birasoherpia*).

When these organs are present, various types of arrangement may be recognized (SALVINI-PLAWEN, 1978; HANDL and TODT, 2005):

- Types with the main cell bodies subepithelially arranged and opening intercellularly. This can be a clustered type: main cell bodies of glands subepithelially arranged and opening intercellularly close together as a paired group directly into the pharynx; and a type A: with subepithelially arranged cell bodies into a pair of outleading ducts.

- Type B: with a paired outleading duct, the intercellularly opening subepithelial gland cells being surrounded by an outer musculature.

- Type C: with a paired duct (surrounded by musculature) of epithelially arranged gland cells.

- Type of *Simrothiella*: with bulbous organs enclosing elongate epithelial gland cells with main cell bodies curved to be longitudinally arranged (modified type C).

- Type D of Amphimeniidae: with a paired, ramified duct, each branch being terminally provided with a package of gland cells.

The Class is divided into four orders, grouped within two supraorders. The supraorder Aplotegmentaria includes the orders Pholidoskepia (6 families) and Neomeniamorpha (2 families); the supraorder Pachytegmentaria includes the

orders Sterrofustia (3 families) and Cavibelonia (12 families). The Pholidoskepia represent the basal group and show different lines of development within the order and, on the one hand, gave rise to the Neomeniamorpha, on the other to the Sterrofustia among which, in turn, might have been the origin of the presumably monophyletic Cavibelonia (SALVINI-PLAWEN, 1978, 1985, 2003).

SYSTEMATIC CLASSIFICATION OF CLASS SOLENOGASTRES TO THE LEVEL OF GENUS

Class SOLENOGASTRES Gegenbaur, 1878

Supraorder APLOTEGMENTARIA Salvini-Plawen, 1978

Order PHOLIDOSKEPIA Salvini-Plawen, 1978

Family DONDESIIDAE Simroth, 1893

Dondersia Hubrecht, 1888

Nematomenia Simroth, 1893

Ichthyomenia Pilsbry, 1898

Stylomenia Pruvot, 1899

Heathia Thiele, 1913

Micromenia Leloup, 1948

Lyratoherpia Salvini-Plawen, 1978

Helluoherpia Handl and Büchinger, 1996

Squamatoherpia Büchinger and Handl, 1996

Family SANDALOMENIIDAE Salvini-Plawen, 1978

Sandalomenia Thiele, 1913

Family LEPIDOMENIIDAE Pruvot, 1902

Lepidomenia Kowalevsky, 1883

Nierstraszia Heath, 1918

Tegulaherpia Salvini-Plawen, 1983

Family GYMNOMENIIDAE Odhner, 1921

Gymnomenia Odhner, 1921

Wirenia Odhner, 1921

Genitoconia Salvini-Plawen, 1967

Family MACELLOMENIIDAE Salvini-Plawen, 1978

Macellomenia Simroth, 1893

Family MEIOMENIIDAE Salvini-Plawen 1985

Meiomenia Morse, 1979

Meioherpia Salvini-Plawen, 1985

Incerta sedis 1

Pholidoherpia Salvini-Plawen, 1978

Order NEOMENIAMORPHA Salvini-Plawen, 1978

Family NEOMENIIDAE Ihering, 1876

Neomenia Tullberg, 1875

Family HEMIMENIIDAE Salvini-Plawen, 1978

Hemimenia Nierstrasz, 1902

Archaeomenia Thiele, 1906

Supraorder PACHYTEGMENTARIA Salvini-Plawen, 1978

Order STERROFUSTIA Salvini-Plawen, 1978

Family PHYLLOMENIIDAE Salvini-Plawen, 1978

Phyllomenia Thiele, 1913

- Harpagoherpia* Salvini-Plawen, 1978
- Lituiherpia* Salvini-Plawen, 1978
- Ocheyoherpia* Salvini-Plawen, 1978
- Family IMEROHERPIIDAE Salvini-Plawen, 1978
- Imeroherpia* Salvini-Plawen, 1978
- Family HETEROHERPIIDAE Salvini-Plawen, 1978
- Heteroherpia* Salvini-Plawen, 1978
- Incerta sedis 2
- Rhabdoherpia* Salvini-Plawen, 1978
- Order CAVIBELONIA Salvini-Plawen, 1978
- Family PRUVOTINIDAE Heath, 1911
- Subfamily PARARRHOPALINAE Salvini-Plawen, 1978
- Pararrhopalia* Simroth, 1893
- Pruvotina* Cockerell, 1903
- Labidoherpia* Salvini-Plawen, 1978
- Subfamily ELEUTHEROMENIINAE Salvini-Plawen, 1978
- Eleutheromenia* Salvini-Plawen, 1967
- Gephyroherpia* Salvini-Plawen, 1978
- Luitfriedia* García-Álvarez and Urgorri, 2001
- Subfamily LOPHOMENIINAE Salvini-Plawen, 1978
- Lophomenia* Heath, 1911
- Metamenia* Thiele, 1913
- Hypomenia* Van Lummel, 1930
- Forcepimenia* Salvini-Plawen, 1969
- Subfamily HALOMENIINAE Salvini-Plawen, 1978
- Halomenia* Heath, 1911
- Subfamily UNCIPHERPIINAE García-Álvarez, Urgorri and Salvini-Plawen, 2001
- Uncimenia* Nierstrasz, 1903
- Sialoherpia* Salvini-Plawen, 1978
- Unciherpia* García-Álvarez, Urgorri and Salvini-Plawen, 2001
- Subfamily uncertain
- Scheltemaia* Salvini-Plawen, 2003
- Family RHOPALOMENIIDAE Salvini-Plawen, 1978
- Rhopalomenia* Simroth, 1893
- Pruvotia* Thiele, 1894
- Dinomenia* Nierstrasz, 1902
- Driomenia* Heath, 1911
- Entonomenia* Leloup, 1948
- Urgorria* García-Álvarez and Salvini-Plawen, 2001
- Family ACANTHOMENIIDAE Salvini-Plawen, 1978
- Acanthomenia* Thiele, 1913
- Amboherpia* Handl and Salvini-Plawen, 2002
- Family AMPHIMENIIDAE Salvini-Plawen, 1972
- Amphimenia* Thiele, 1894
- Proparamenia* Nierstrasz, 1902
- Alexandromenia* Heath, 1911
- Pachymenia* Heath, 1911
- Spengelomenia* Heath, 1912
- Paragymnomenia* Leloup, 1947
- Meromenia* Leloup, 1949
- Plathymenia* Schwabl, 1961
- Sputoherpia* Salvini-Plawen, 1978
- Utralvoherpia* Salvini-Plawen, 1978

- Family SIMROTHIELLIDAE Salvini-Plawen, 1978
Simrothiella Pilsbry, 1898
Cyclomenia Nierstrasz, 1902
Kruppomenia Nierstrasz, 1903
Biserramenia Salvini-Plawen, 1967
Birasoherpia Salvini-Plawen, 1978
Helicoradomenia Scheltema and Kuzirian, 1991
Plawenia Scheltema and Schander, 2000
Spiomenia Arnofsky, 2000
Aploradoherpia Salvini-Plawen, 2004
- Family DREPANOMENIIDAE Salvini-Plawen, 1978
Drepanomenia Heath, 1911
- Family STROPHOMENIIDAE Salvini-Plawen, 1978
Strophomenia Pruvot, 1899
Anamenia Nierstrasz, 1908
- Family PRONEOMENIIDAE Simroth, 1893
Proneomenia Hubrecht, 1880
Dorymenia Heath, 1911
- Family EPIMENIIDAE Salvini-Plawen, 1978
Epimenia Nierstrasz, 1908
Epiherpia Salvini-Plawen, 1997
- Family SYNGENOHERPIIDAE Salvini-Plawen, 1978
Syngenoherpia Salvini-Plawen, 1978
- Family RHIPIDOHERPIIDAE Salvini-Plawen, 1978
Rhipidoherpia Salvini-Plawen, 1978
Thieleherpia Salvini-Plawen, 2004
- Family NOTOMENIIDAE Salvini-Plawen, 2004
Notomenia Thiele, 1897

KEY TO FAMILIES

1. Sclerites as scales or as scales and solid acicular spicules. Cuticle thin or moderately thick relative to the body 2
1. Sclerites as acicular spicules only. Cuticle generally thick, with epidermal papillae 3
2. With scales, occasionally acicular sclerites 4
2. With lancelolated sclerites (with distal wings) and smooth or groove-like scales, sometimes with solid acicles. Without ventral foregut glandular organs. With two pairs of copulatory stylets with glands. With respiratory organs 12
3. Only with solid acicular sclerites 13
3. With hollow acicular sclerites 17
4. With claviform scales. With monoserial radula of serrate plates. Subepithelial ventral foregut gland cells (type A) Family Macellomeniidae
4. Without claviform scales 5
5. Without radula. Subepithelial ventral foregut gland cells (type A) Family Dondersiidae (part)
5. With radula 6

6. Monoserial radula with paired denticles. Subepithelial ventral foregut gland cells (type A) Family Dondersiidae (part)
6. Other type of radula 7
7. Radula formed of simply serrate plates (with denticles subequal in size) 8
7. Other type of radula (heterodenticulate plates or distichous) 9
8. Biserial radula (probably) of serrate plates. Seminal receptacles in bundles ...
..... Family Sandalomeniidae
8. Monoserial radula. Subepithelial ventral foregut glandular organs (type A) ...
..... Genus *Pholidoherpia*
9. Biserial radula (with paired plates or bars bearing denticles). Ventral foregut glandular organs not of so-called type A (paired duct with subepithelially arranged gland cells)..... Family Simrothiellidae (part)
9. Radula distichous 10
10. Ventral foregut glandular organs of accumulated subepithelial pharyngeal glands (clustered type) Family Gymnomeniidae
10. Ventral foregut glandular organs of ducts with subepithelially arranged gland cells (type A) 11
11. With only one type of scales Family Lepidomeniidae
11. With three or more types of scales, one projecting radially from the cuticle
..... Family Meiodomeniidae
12. Thin cuticle without epidermal papillae. With scales and solid spicules. With short harpoon-shaped bodies sclerites with pedestal restricted to certain parts of the body. Radula (if present) polyserial Family Hemimeniidae
12. Thick cuticle, in general with epidermal papillae. Sclerites as solid acicules and/or elongate groove-shaped elements, often distally lanceolate. Radula unknown /absent in known species Family Neomeniidae
13. Without radula Genus *Rhabdoherpia*
13. With radula 14
14. Radula tetraserial. Ventral foregut glandular organs with subepithelial gland cells surrounded by musculature (type B) Family Imeroherpiidae
14. Other type of radula and of ventral foregut glandular organs 15
15. Biserial radula (rows of paired denticulate radula plates or bars). Ventral foregut glandular organs of accumulated subepithelially opening gland cells (clustered type) Family Simrothiellidae (part)
15. Radula distichous 16
16. Subepithelial gland cell bodies of ventral foregut glandular organs free (type A) .
..... Family Phyllomeniidae
16. Subepithelial gland cell bodies of ventral foregut glandular organs surrounded by musculature (type B) Family Heteroherpiidae
17. With hollow, hook shaped sclerites 18
17. Without hollow, hook shaped sclerites 19

18. Ventral foregut glandular organs with epithelial gland cells (type C)	
..... Genus <i>Scheltemaia</i>	
18. Ventral foregut glandular organs of ducts with subepithelially arranged gland cells (type A) or circumpharyngeal follicular glands ...	Family Pararrhopaliidae (part)
19. Without radula	20
19. With radula	28
20. Without ventral foregut glandular organs	Family Rhopalomeniidae (part)
20. With ventral foregut glandular organs	21
21. Circumpharyngeal follicular glands	Family Pararrhopaliidae (part)
21. Ventral foregut glandular organs of another type	22
22. Foregut glandular organs of ramified ducts with terminal clusters of gland cells (type D), generally opening pre-radularly	Family Amphimeniidae (part)
22. Foregut glandular organs of another type	23
23. Two types of foregut glandular organs: Gland cells subepithelial (type A) and gland cells epithelial (type C)	Family Rhopalomeniidae (part)
23. Foregut glandular organs of another type	24
24. Ventral foregut glandular organs with subepithelial gland cells surrounded by musculature (type B)	Family Strophomeniidae (part)
24. Ventral foregut glandular organs of another type	25
25. Ventral foregut glandular organs of ducts with subepithelially arranged gland cells (type A)	26
25. Ventral foregut glandular organs with epithelial gland cells (type C)	27
26. Mantle sclerites acicular and in several layers ...	Family Rhopalomeniidae (part)
26. Mantle bodies stout with cavity filled by a matrix, arranged in one layer	Family Notomeniidae
27. Mantle sclerites arranged tangentially in several intercrossed layers. Without respiratory folds	Family Rhopalomeniidae (part)
27. Mantle sclerites arranged radially in one layer. With respiratory organs	Family Drepanomeniidae
28. With biserial radula (series of paired plates or bars). Ventral foregut glandular organs of accumulated subepithelially opening gland cells (clustered type)	Family Simrothiellidae (part)
28. Other type of radula and of ventral foregut glandular organs	29
29. Radula pectinate (monoserial or divided with dense elongate denticles), ventral foregut glandular organs of tubes with subepithelial gland cells surrounded by musculature (type B)	Family Strophomeniidae (part)
29. Other type of radula (monoserial, distichous, polyserial/polystichous)	30
30. With monoserial radula	31
30. Other type of radula	32

- 31. Ventral foregut glandular organs of ducts with subepithelially arranged gland cells (type A) Family Acanthomeniidae
- 31. Foregut glandular organs of ramified ducts with terminal clusters of gland cells (type D) Family Amphimeniidae (part)
- 32. With polystichous/polyserial radula 33
- 32. With distichous radula 34
- 33. Ventral foregut glandular organs of ducts with subepithelially arranged gland cells (type A) Family Rhipidoherpiidae
- 33. Ventral foregut glandular organs with epithelial gland cells (type C) Family Proneominiidae
- 34. Ventral foregut glandular organs of ducts with subepithelially arranged gland cells (type A) 35
- 34. Ventral foregut glandular organs of another type 36
- 35. Without respiratory organs Family Rhopalomeniidae (part)
- 35. With respiratory organs Family Pararrhopaliidae (part)
- 36. Ventral foregut glandular organs with subepithelial gland cells surrounded by musculature (type B) Family Syngenoherpiidae
- 36. Ventral foregut glandular organs with epithelial gland cells (type C) Family Epimeniidae

Class SOLENOGASTRES Gegenbaur, 1878

Solenogastres Gegenbaur, 1878, sensu Simroth, 1893. *Amphineura in: H.G. Bronn's Klassen und Ordnungen der Tierreichs*, 3 (1): 131.

Bilaterally symmetrical molluscs with the mantle-epithelium covered by a chitinous cuticle and by calcareous sclerites of aragonite. Body laterally narrowed, foot restricted to a medioventral groove. Subterminal pallial cavity without ctenidia, in part with secondary respiratory formations. Mouth opening behind or fused with a papillous sensorial cavity (atrium, vestibulum). Midgut straight and spacious, without separate digestive gland, due to dorsoventral musculature generally with serial con-

strictions causing lateral pouches. Paired ventral and lateral nerve cords separated throughout, in part ganglionated. Hermaphrodites, with paired dorsal gonad generally opening by two short ducts into pericardium; pericardioducts opening into spawning ducts (internalised termino-lateral portions of pallial cavity). Without aorta and excretory organs. Marine, freely moving upon sediments or living epizoic on Cnidaria; carnivorous, mostly feeding on Cnidaria.

Superorder APLOTEGMENTARIA Salvini-Plawen, 1978

Aplotegmentaria Salvini-Plawen, 1978. *Zoologica*, 44 (128): 23.

Mantle sclerites as scales and/or solid acicular spicules in one layer only, no sclerites with internal

cavity; mantle cuticle relatively thin, mostly without epidermal papillae.

Order PHOLIDOSKEPIA Salvini-Plawen, 1978

Pholidoskepia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 23.

Mantle almost exclusively with scaly sclerites. Ventral foregut glandular organs with subepithelially arranged gland cell bodies (clustered type or type A).

Family DONDERSIIDAE Simroth, 1893

Dondersiidae Simroth, 1893. *Amphineura in: H.G. Bronn's Klassen und Ordnungen der Tierreichs*, 3 (1): 225.

Synonyms: Myzomeniidae Thiele, 1894 (part).

Sclerites of two or more types of scales, occasionally with solid acicular spicules. Without epidermal papillae. Radula monoserial, with paired long denticles. Ventral foregut glandular organs of ducts with subepithelial gland cells (type A). Without respiratory organs.

Genus *Dondersia* Hubrecht, 1888

Dondersia Hubrecht, 1888. *Donders Feestbrendel*, Amsterdam: 324.

TYPE SPECIES: *Dondersia festiva* Hubrecht, 1888.

At least with two types of scales. Mouth separated from the atrium. Radula-plates with one pair of lateral, medially curved denticles. Midgut with lateral constrictions. Unpaired secondary genital opening. With dorsoterminal sense organ. Without copulatory stylets and respiratory organs.

Dondersia festiva Hubrecht, 1888, in *Feestbundel Donders Tijdschr. Geneesk.* (Amsterdam) Holotype: Gulf of Naples (Italy); 60 m; Mus. Nat. Hist. Leiden, Netherlands.
Literature: Nierstrasz and Stork, 1940, in *Zoologica*, 36 (99).

Dondersia annulata Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47
Holotype: Bima, Sumbawa, Sunda-Sea (Indonesia) (*Siboga* St. 47); 55 m; Zool. Mus. Univ. Amsterdam, Netherlands.
Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47.

Dondersia californica Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: San Diego, (California, USA) (*Albatross* St. 4303); 38 m; Calif. Acad. Sci., San Francisco, USA.
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Dondersia cnidevorans Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Ross Sea (Antarctica); 659-714 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dondersia indica Stork, 1941, in *Siboga-Exp. Monogr.*, 47b
Holotype: Bima, Sumbawa, Sunda-Sea, (Indonesia); 55 m; (Type material missing).
Literature: Stork, 1941, in *Siboga-Exp. Monogr.*, 47b.

Dondersia laminata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Bransfield Strait, (Graham Land, Antarctica); 311-426 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dondersia stylastericola Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Shetland Islands (Antarctica); 300 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Nematomenia* Simroth, 1893

Nematomenia Simroth, 1893. *Zeitschrift für wissenschaftliche Zoologie*, 56 (2): 324.

Synonyms: *Echinomenia* Simroth, 1893; *Myzomenia* Simroth, 1893; *Herpomenia* Heath, 1911.

TYPE SPECIES: *Dondersia flavens* Pruvot, 1890.

With leaf-shaped and scattered oar-shaped scales. With common atrio-buccal opening. Monoserial radula plates with two pairs of distally narrowed denticles, or missing in the radula sheath, or lacking and sheath forming

the outlet of the ducts of the ventral foregut glandular organs. Midgut without lateral constrictions. Secondary genital opening unpaired. With dorsoterminal sense organ. Without copulatory stylets and respiratory organs.

Nematomenia flavens (Pruvot, 1890) in *Archives Zool. Exp. gén., sér. 2*, 8

Dondersia flavens Pruvot, 1890

Holotype: Banyuls-sur Mer (France); 45-90 m; (Type material missing).

Distribution: Banyuls (France), Costa Brava (Spain), Shetland Islands (North Sea); 45-167 m.

Literature: Pruvot, 1891, in *Arch. Zool. Exp. Gén.*, (2) 9. Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Nematomenia arctica Thiele, 1913, in *Sitzungsber. Ges. Naturf. Freunde Berlin*, 2

Holotype: Spitzbergen, (Svalbard archipelago, Arctic); Museum für Naturkunde, Berlin, Germany, Moll. 105.380 b.

Literature: Thiele 1913 in *Sitzungsber. Ges. Naturf. Freunde Berlin*, 2.

Nematomenia banyulensis (Pruvot, 1890), in *Archives Zool. Exp. gén., sér. 2*, 8

Dondersia banyulensis Pruvot, 1890

Holotype: Côte Vermeille (Roussillon, France); 45-300 m; (Type material missing).

Distribution: Dalmatia (Croatia) to Trondheimsfjord (Norway); 31-300 m.

Literature: Nierstrasz and Stork, 1940, in *Zoologica*, 36 (99). Handl and Salvini-Plawen, 2001, in *Sarsia*, 86. Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Nematomenia corallophila (Kowalevsky, 1881), in *Izv. Imp. Obshch. Lyub. Estest. Antrop. Etnogr. Mosk. Univ.*, 43 (1)

Neomenia corallophila Kowalevsky, 1881

Holotype: La Calle (Algeria); 73-183 m; (Type material missing).

Literature: Salvini-Plawen, 1997, in *Iberus*, 15 (2).

Nematomenia glacialis Thiele, 1913, in *Dtsch. Südpolar Exp.*, 14 (*Zool.* 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Nematomenia incirrata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Orkney Islands (Antarctica); 298-302 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Nematomenia platypoda (Heath, 1911), in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Herpomenia platypoda Heath, 1911

Holotype: Agattu Island (Aleutians Islands) (*Albatross* St. 4781); 880 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Nematomenia protecta Thiele, 1913, in *Dtsch. Südpolar Exp.*, 14 (Zool. 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Nematomenia ptyalosa Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica); 148-201 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Sandwich Islands to Tierra del Fuego (South America); 135-201 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Nematomenia squamosa Thiele, 1913, in *Dtsch. Südpolar Exp.*, 14 (Zool. 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Nematomenia tegulata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica); 148-201 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Sandwich Islands, Falkland Islands, Tierra del Fuego (South America); 135-494 m.

Literature: Salvini-Plawen 1978 in *Zoologica*, 44 (128).

Genus *Ichthyomenia* Pilsbry, 1898

Ichthyomenia Pilsbry, 1898. *Manual of Conchology*, 17: 305.

Synonyms: *Ismenia* Pruvot, 1891.

TYPE SPECIES: *Dondersia ichthyodes* Pruvot, 1890.

With discoidal scales and with knife-blade shaped elements. With common atrio-buccal opening. Radula teeth each with one pair of lateral, medially curved

denticles. Midgut with lateral constrictions. Secondary genital opening unpaired. Without dorsoterminal sense organ, copulatory stylets and respiratory organs.

Ichthyomenia ichthyodes (Pruvot, 1890), in *Arch. Zool. Exp. Gén.*, (2) 8

Dondersia ichthyodes Pruvot, 1890

Ismenia ichthyodes (Pruvot, 1891)

Holotype: Roussillon (France); 80 m; (Type material missing).

Literature: Pruvot, 1891, in *Arch. Zool. Exp. Gén.*, (2) 9.

Genus *Stylomenia* Pruvot, 1899

Stylomenia Pruvot, 1899. *Archives de Zoologie Expérimentale et Générale* (3) 7: 461.

TYPE SPECIES: *Stylomenia salvatori* Pruvot, 1899.

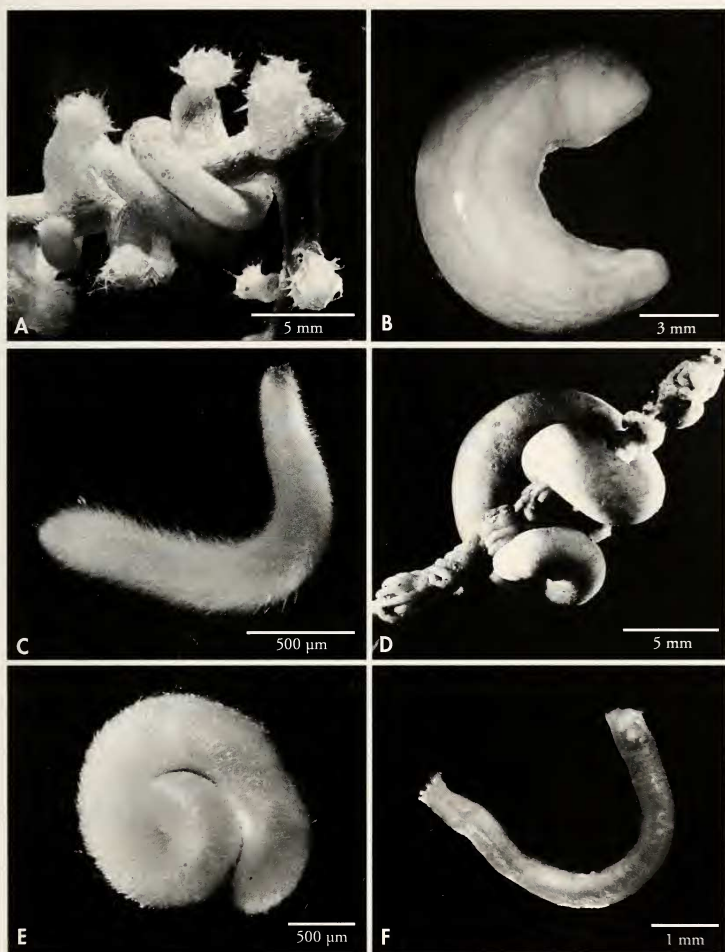


Figure 1. A: *Anamenia gorgonophila* (West of Galicia, NW Spain, 507-650 m deep); B: *Neomenia* sp. (Antarctic Peninsula, 1272 m deep); C: *Biserramenia psammobionta* (Ría de Ferrol, NW Spain, 12-14 m deep); D: *Dorymenia menchuescribanae* (South Shetland Island, Antarctica, 50-66 m deep); E: *Amboherpia* sp. (Abyssal Angola Basin, 5389-5395 m deep); F: *Wirenia argentea* (West of Galicia, NW Spain, 400 m deep).

Figura 1. A: *Anamenia gorgonophila* (oeste de Galicia, NO de España, 507-650 m); B: *Neomenia* sp. (Península Antártica, 1272 m); C: *Biserramenia psammobionta* (Ría de Ferrol, NO de España, 12-14 m); D: *Dorymenia menchuescribanae* (isla Shetland del Sur, Antártida, 50-66 m); E: *Amboherpia* sp. (cuenca abisal de Angola, 5389-5395 m); F: *Wirenia argentea* (oeste de Galicia, NO de España, 400 m).

Scales in one layer. Mouth separated from the atrium. Radula plates with one pair of lateral, medially curved denticles. Midgut with lateral constrictions.

Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Stylomenia salvatori Pruvot, 1899 in *Arch. Zool. Exp. Gén.*, (3) 7

Holotype: Banyuls-sur-Mer (France); Litoral; (Type material missing).

Literature: Pruvot, 1899, in *Arch. Zool. Exp. Gén.*, (3) 7.

Stylomenia sulcodoryata Handl and Salvini-Plawen, 2001, in *Sarsia*, 86

Holotype: Herdla fjord (Bergen, Norway); 185 m; Zool. Mus. Uppsala Univ., Sweden.

Distribution: Herdla fjord, Filla fjord (Norway); 185 m.

Literature: Handl and Salvini-Plawen, 2001, in *Sarsia*, 86.

Genus *Heathia* Thiele, 1913

Heathia Thiele, 1913. *Das Tierreich*, 38: 17.

TYPE SPECIES: *Ichthyomenia porosa* Heath, 1911.

Mantle with small scales and solid long paddle-like elements. With common atrio-buccal opening. Radula absent. Midgut with lateral constrictions.

Secondary genital opening unpaired. Without dorsoterminal sense organ. Without copulatory stylets and respiratory organs.

Heathia porosa (Heath, 1911), in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)

Ichthyomenia porosa Heath, 1911

Holotype: San Diego, (California, USA), (*Albatross* St. 4400), 920-990 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Scheltema, 1998, in *Taxonomic Atlas benthic Fauna Sta Maria Bassin and West Sta Barbara Channel* (Sta Barbara Mus. Nat. Hist., California).

Genus *Micromenia* Leloup, 1948

Micromenia Leloup, 1948. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 24 (19): 1.

Synonyms: *Rupertomenia* Schwabl, 1955.

TYPE SPECIES: *Micromenia simplex* Leloup, 1948.

Mouth separated from the atrium. Radula-plates with one pair of lateral, medially curved denticles. Midgut without lateral constrictions. Secondary

genital opening unpaired. With dorsoterminal sense organ. Without copulatory stylets and respiratory organs.

Micromenia simplex Leloup, 1948, in *Bull. Mus. Roy. Hist. nat. Belgique*, 24 (19)

Holotype: Hope Island, (Barents Sea, Arctic); 48 m; Oceanograph. Mus. Monaco.

Literature: Leloup, 1950, in *Résult. Camp. Sc. Monaco*, 110. Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3).

Micromenia fodiens (Schwabl, 1955), in *Österr. Zool. Zeitschr.*, 6

Rupertomenia fodiens Schwabl, 1955.

Holotype: Gullmarfjord, (Sweden); 40 m; Naturhist. Mus. Wien, Austria.

Distribution: Skagerrak to Trondheims-Fjord (Scandinavia).

Literature: Salvini-Plawen, 1988, in *Ann. Naturhist. Mus. Wien*, 90 B; 2003 in *Iberus*, 21 (2).

Micromenia subrubra Salvini-Plawen, 2003, in *Iberus*, 21

Holotype: Malta (Mediterranean Sea); 140 m; Naturhist. Mus. Wien, Austria.

Literature: Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Genus *Lyratoherpia* Salvini-Plawen, 1978

Lyratoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 34.

TYPE SPECIES: *Lyratoherpia carinata* Salvini-Plawen, 1978.

With at least two types of scales.
Mouth separated from the atrium.
Radula-plates with four denticles, the
two inner ones medially curved. Midgut

with lateral constrictions. Secondary
genital opening unpaired. With dorso-
terminal sense organ. Without copula-
tory stylets and respiratory organs.

Lyratoherpia carinata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica); 344-351 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Ross Sea (Antarctica); 344-714 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Lyratoherpia bracteata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica); 148-201; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Lyratoherpia (?) *incali* Scheltema, 1999, in *Ophelia*, 51

Holotype: West European Basin; 2091 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Scheltema, 1999, in *Ophelia*, 51.

Genus *Helluoherpia* Handl and Büchinger, 1996

Helluoherpia Handl and Büchinger, 1996. *Annalen des naturhistorischen Museums in Wien*, 98B: 66

TYPE SPECIES: *Helluoherpia aegiri* Handl and Büchinger, 1996

With scales and solid acicular
spicules, no epidermal papillae. With
common atrio-buccal opening. Radula-
plates with three denticles. Secondary

genital opening unpaired. Without
dorsoterminal sense organ. Without
copulatory stylets and respiratory
folds.

Helluoherpia aegiri Handl and Büchinger, 1996, in *Ann. Naturhist. Mus. Wien*, 98 B

Holotype: Herdla fjord (Bergen, Norway); 185-250 m; Naturhist. Mus. Wien, Austria.

Literature: Handl and Büchinger, 1996 in *Ann. Naturhist. Mus. Wien*, 98 B.

Genus *Squamatoherpia* Büchinger and Handl, 1996

Squamatoherpia Büchinger and Handl, 1996. *Annalen des naturhistorischen Museums in Wien*, 98B: 58.

TYPE SPECIES: *Squamatoherpia tricuspidata* Büchinger and Handl, 1996.

With one type of scales, without epidermal papillae. Mouth separated from the atrium. Radula-plates with three denticles.

With dorsoterminal sense organ. Secondary genital opening unpaired. Without copulatory stylets and respiratory folds.

Squamatoherpia tricuspidata Büchinger and Handl, 1996, in *Ann. Naturhist. Mus. Wien*, 98 B

Holotype: Bergen (Norway); 250 m; Naturhist. Mus. Wien, Austria.

Literature: Büchinger and Handl, 1996, in *Ann. Naturhist. Mus. Wien*, 98 B.

Family SANDALOMENIIDAE Salvini-Plawen, 1978

Sandalomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 48.

Thin cuticle, sclerites as scales in one layer. With (probably biserial) radula plates. Ventral foregut glandular organs with subepithelially

arranged gland cells (with or without ? surrounding musculature) opening into a pair of outleading ducts (type A or B).

Genus *Sandalomenia* Thiele, 1913

Sandalomenia Thiele, 1913. *Deutsche Südpolar-Expedition 1901-1903*, 14, *Zoologie*, 6 (1): 41.

TYPE SPECIES: *Sandalomenia papilligera* Thiele, 1913.

Mantle with small scales, no epidermal papillae. Mouth separated from the atrium. Radula-plates simply serrate. Ventral foregut glandular organs open into a subradular sack. Secondary

genital opening unpaired. Without copulatory stylets. Recaptacula seminis in bundles. Without dorsoterminal sense organ. Presence of respiratory organs uncertain.

Sandalomenia carinata Thiele, 1913, in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Sandalomenia papilligera Thiele, 1913, in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Family LEPIDOMENIIDAE Pruvot, 1902

Lepidomeniidae Pruvot, 1902. *Archives de zoologie expérimentale et générale 3ème serie. Notes et Revue*, 2: 22.

Thin cuticle, sclerites as scales in one layer. Radula distichous. Ventral foregut glandular organs with subepi-

thelially arranged gland cells opening into a pair of outleading ducts (type A?).

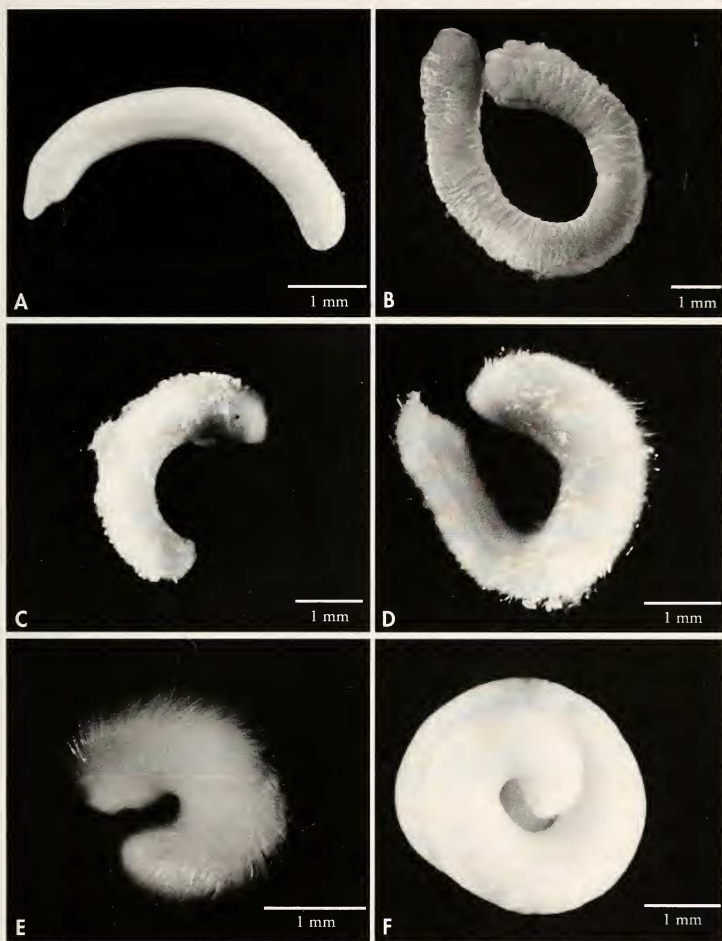


Figure 2. A: *Dorymenia troncosoi* (South Shetland Island, Antarctica, 65-240 m deep); B: *Hemimenia* sp. (West of Galicia, NW Spain, 1000 m deep); C: *Urgorria compostelana* (West of Galicia, NW Spain, 760-769 m deep); D: *Unciherpia hirsuta* (West of Galicia, NW Spain, 760-769 m deep); E: *Spiomenia* sp. (Abyssal Angola Basin, 5415 m deep); F: *Rhopalomenia aglaopheniae* (Peñas Cape, N Spain, 122-124 m deep).

Figura 2. A: *Dorymenia troncosoi* (isla Shetland del Sur, Antártida, 65-240 m); B: *Hemimenia* sp. (oeste de Galicia, NO de España, 1000 m); C: *Urgorria compostelana* (oeste de Galicia, NO de España, 760-769 m); D: *Unciherpia hirsuta* (oeste de Galicia, NO Spain, 760-769 m); E: *Spiomenia* sp. (cuenca abisal de Angola, 5415 m); F: *Rhopalomenia aglaopheniae* (Cabo Peñas, N de España, 122-124 m).

Genus *Lepidomenia* Kowalevsky, 1883

Lepidomenia Kowalevsky, 1883. *Zoologischer Jahresbericht* (1882), 3: 29.

TYPE SPECIES: *Lepidomenia hystrix* Marion and Kovalevsky, 1886.

Mantle without epidermal papillae.
With common atrio-buccal opening.
Midgut without constrictions. Secondary

genital opening unpaired. Without copulatory stylets. Without dorsoterminal sense organ. Without respiratory folds.

Lepidomenia hystrix Marion and Kowalevsky, 1886, in *C.R. Sci. Acad. Paris*, 103 (2); non Swedmark, 1956, in *Arch. Zool. Exp. gén.* 93

Holotype: Marseille (France); 30 m; (Type material missing).

Literature: Kowalevsky and Marion, 1887, in *Ann. Mus. Hist. Nat. Marseille, Zool.*, III (1). Salvini-Plawen, 1985, in *Stygologia*, 1.

Lepidomenia harpagata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Georgia; (Antarctica); 252-310 m; Univ. Zool. Mus. Uppsala, Sweden.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Lepidomenia (?) *swedmarki* Salvini-Plawen, 1985, in *Stygologia*, 1

Lepidomenia hystrix Kow. and Mar. in Swedmark, 1956,

Holotype: Marseille (France); Interstitial; (Type material missing).

Literature: Salvini-Plawen, 1985b, in *Stygologia*, 1. García-Álvarez, Urgorri and Cristobo, 2000, in *Argonauta*, XIV (2).

Genus *Nierstraszia* Heath, 1918

Nierstraszia Heath, 1918. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 45 (2): 193.

TYPE SPECIES: *Nierstraszia fragile* Heath, 1918.

Mantle without epidermal papillae.
With common atrio-buccal opening.
Midgut with constrictions. Secondary
genital opening unpaired. With copula-

tory stylets. With several receptacula seminis. With dorsoterminal sense organ. Mantle cavity with glandular folds.

Nierstraszia fragile Heath, 1918, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2)

Holotype: New Jersey (USA); 865 m; (Type material missing).

Literature: Heath, 1918, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2).

Genus *Tegulaherpia* Salvini-Plawen, 1983

Tegulaherpia Salvini-Plawen, 1983. *Mollusca*, in: Riedl, R. 2d. *Fauna and Flora des Mittelmeeres*. P. Parey. Hamburg and Berlin: 253.

TYPE SPECIES: *Tegulaherpia stimulosa* Salvini-Plawen, 1983.

Mantle with oval scales, without epidermal papillae Mouth opening separated from the atrium. Midgut without constrictions. Secondary

genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Tegulaherpia stimulosa Salvini-Plawen, 1983, in *Mollusca: Fauna and Flora des Mittelmeeres* (R.Riedl, Ed.; Parey-Verlag)

Holotype: Dalmatia (Croatia); 75-80 m; Naturhist. Mus. Wien, Austria.

Literature: Salvini-Plawen, 1988, in *Ann. Naturhistor. Mus. Wien*, 90 B.

Tegulaherpia myodoryata Salvini-Plawen, 1988, in *Ann. Naturhistor. Mus. Wien*, 90 B
Tegulaherpia celtica Caudwell, Jones and Killeen, 1995

Holotype: Banyuls-sur-Mer (France); 75-80 m; Naturhistor. Mus. Wien, Austria.

Distribution: Livorno (Italy) to Trondheim (Norway); 75-470 m.

Literature: Salvini-Plawen, 1997, in *Iberus*, 15 (2); 2003, in *Iberus*, 21 (2). Handl and Salvini-Plawen, 2001, in *Sarsia*, 86.

Tegulaherpia tasmanica Salvini-Plawen, 1988, in *Ann. Naturhistor. Mus. Wien*, 90 B

Holotype: Bass Strait (Tasmania); 50-55 m; Tasmania Mus., Hobart, Australia.

Distribution: Bass Strait; 50-120 m.

Literature: Scheltema, 1999, in *Rec. Australian Mus.*, 51.

Family GYMNOTENIIDAE Odhner, 1921

Gymnoteniidae Odhner, 1921. *Bergens Museums Aarbok 1918-19, Naturvidenskabelig raekke*, 3: 9.

Synonyms: Wreniidae Salvini-Plawen, 1978.

Thin cuticle, sclerites as scales in one layer. Radula distichous. Ventral foregut glandular organs with subepithelially

arranged, pairwise accumulated gland cells (clustered type). Ventral ganglia with a commissural sac.

Genus *Gymnotenia* Odhner, 1921

Gymnotenia Odhner, 1921. *Bergens Museums Aarbok 1918-19, Naturvidenskabelig raekke*, 3: 48.

TYPE SPECIES: *Gymnotenia pellucida* Odhner, 1921.

Mantle without epidermal papillae. Mouth opening separated from the atrium. Midgut with constrictions. Secondary genital opening unpaired.

With copulatory stylets. Without receptacula seminis. With dorsoterminal sense organ. Without respiratory organs.

Gymnotenia pellucida Odhner, 1921, in *Bergens Mus. Aarbok*, 1918/19 3

Holotype: Sunde, Hardangerfjord (Norway), 150 m; Syntypes in Svenska Mus.Nat.Hist., Stockholm, Sweden and Zoologisk Museum Oslo, Norway.

Literature: Handl and Salvini-Plawen, 2001, in *Sarsia*, 86.

Gymnotenia (?) *minuta* Scheltema, 1998, in *Taxonomic Atlas benthic Fauna Sta Maria Bassin and West Sta Barbara Channel* (Sta Barbara Mus. Nat. Hist., California)

Holotype: Sta Maria Bassin (California, USA), 409-410 m; Nat. Mus. Nat. Hist., Washington DC, USA.

Literature: Scheltema, 1998, in *Taxonomic Atlas benthic Fauna Sta Maria Bassin and West Sta Barbara Channel* (Sta Barbara Mus. Nat. Hist., California).

Gymnotenia virgulata Scheltema, 1999, in *Ophelia*, 51

Holotype: Walvis Bay (Namibia); 619-622 m; Nat. Mus. Nat. Hist., Washington DC, USA.

Literature: Scheltema, 1999, in *Ophelia*, 51.

Genus *Wirenia* Odhner, 1921

Wirenia Odhner, 1921. *Bergens Museums Aarbok* 1918-19, *Naturvidenskabelig raekke*, 3: 31.

Synonyms: *Aesthoherpia* Salvini-Plawen, 1985.

TYPE SPECIES: *Wirenia argentea* Odhner, 1921.

Mantle with elongate scales, without epidermal papillae. With common atrio-buccal opening. Slight constrictions of midgut. Secondary genital opening

paired or single. With copulatory stylets. With receptacula seminis. With dorsoterminal sense organ. With respiratory organs.

Wirenia argentea Odhner, 1921, in *Bergens Mus. Aarbok*, 1918/19 3

Aesthoherpia glandulosa Salvini-Plawen, 1985

Holotype: Sunde, Hardangerfjord (Norway); 150 m; Svenska Mus. Nat. Hist., Stockholm, Sweden

Distribution: W-SW Norway, Galicia (NW Spain), Adriatic Sea, Aegean Sea; 95-700 m.

Literature: Salvini-Plawen, 1988, in *Ann. Naturhistor. Mus. Wien*, 90 B. Handl and Salvini-Plawen, 2001, in *Sarsia*, 86. Todt and Salvini-Plawen, 2004, in *Zoomorphology*, 123, 2004 in *J. Moll. Stud.*, 70.

Wirenia gonoconota (Salvini-Plawen, 1988), in *Ann. Naturhistor. Mus. Wien*, 90 B

Aesthoherpia gonoconota Salvini-Plawen, 1988

Holotype: Norway (65° 43' N, 05° 14' W); 793 m; Naturhist. Mus. Wien, Austria.

Literature: Salvini-Plawen, 1988, in *Ann. Naturhistor. Mus. Wien*, 90 B.

Genus *Genitoconia* Salvini-Plawen, 1967

Genitoconia Salvini-Plawen, 1967. *Sarsia*, 27: 3.

TYPE SPECIES: *Genitoconia rosea* Salvini-Plawen, 1967.

Mantle without epidermal papillae. With common atrio-buccal opening. Midgut without constrictions. Secondary genital opening

single. With copulatory stylets. With receptacula seminis. Without dorsoterminal sense organ. With respiratory organs.

Genitoconia rosea Salvini-Plawen, 1967, in *Sarsia*, 27

Holotype: Korsfjord (Bergen, Norway), 690 m; Zoologisk Museum Bergen, Norway.

Distribution: Korsfjord, Bjørnafjord (Bergen, Norway); 350-700 m.

Literature: Salvini-Plawen, 1967, in *Sarsia*, 27. Todt and Salvini-Plawen, 2004a, in *Zoomorphology*, 123.

Genitoconia atriolonga Salvini-Plawen, 1967, in *Sarsia*, 27

Holotype: Korsfjord (Bergen, Norway), 690 m; Zoologisk Museum, Bergen, Norway.

Distribution: Korsfjord, Bjørnafjord (Bergen/Norway); 350-700 m.

Literature: Salvini-Plawen, 1967, in *Sarsia*, 27.

Genitoconia (?) *mariensis* Scheltema, 1998, in *Taxonomic Atlas benthic Fauna Sta Maria Bassin and West Sta Barbara Channel* (Sta Barbara Mus. Nat. Hist., California)

Holotype: Sta Maria Bassin (California, USA), 145-154 m; Nat. Mus. Nat. Hist., Washington DC, USA.

Literature: Scheltema, 1998, in *Taxonomic Atlas benthic Fauna Sta Maria Bassin and West Sta Barbara Channel* (Sta Barbara Mus. Nat. Hist., California).

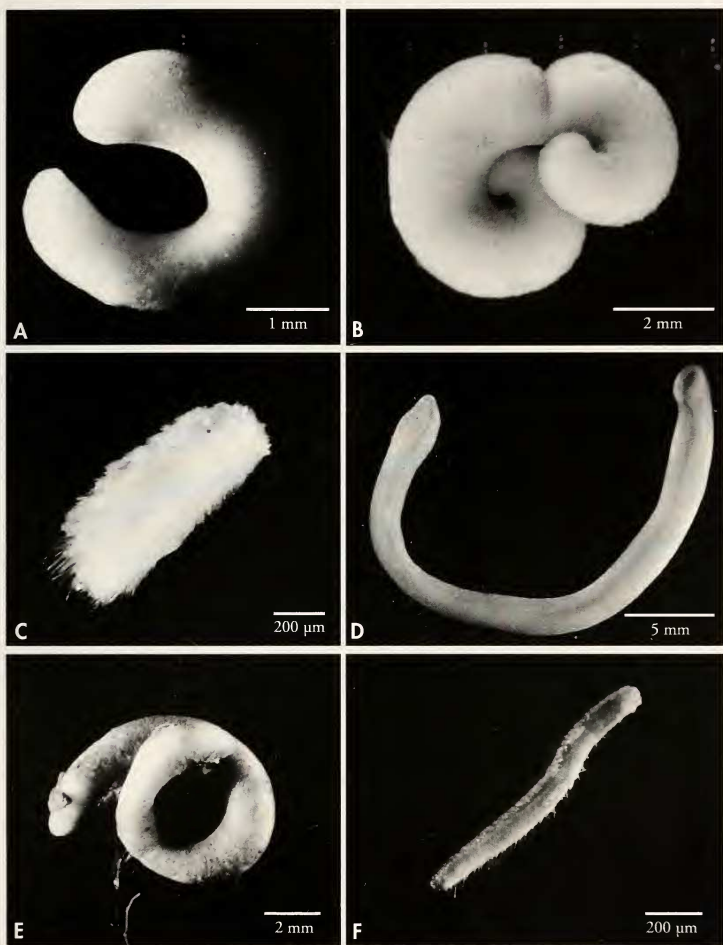


Figure 3. A: *Sputoherpia galliciensis* (West of Galicia, NW Spain, 752 m deep); B: *Rhopalomenia rhynchopharyngeata* (South Shetland Island, Antarctica, 235 m deep); C: *Luitfriedia minuta* (West of Galicia, NW Spain, 507-769 m deep); D: *Proneomenia* sp. (Bellingshausen Sea, Antarctica, 603 m deep); E: *Dorymenia hesperidesi* (South Shetland Island, Antarctica, 235 m deep); F: *Meioherpia* sp. (Ría de Ferrol, NW Spain, 11-12 m deep).

Figura 3. A: *Sputoherpia galliciensis* (oeste de Galicia, NO de España, 752 m); B: *Rhopalomenia rhynchopharyngeata* (isla Shetland del Sur, Antártida, 235 m); C: *Luitfriedia minuta* (oeste de Galicia, NO de España, 507-769 m); D: *Proneomenia* sp. (Mar de Bellingshausen, Antártida, 603 m); E: *Dorymenia hesperidesi* (isla Shetland del Sur, Antártida, 235 m); F: *Meioherpia* sp. (Ría de Ferrol, NO de España, 11-12 m).

Family MACELLOMENIIDAE Salvini-Plawen, 1978

Macellomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 24.

Thin cuticle, sclerites as nail-shaped bodies (basal plate with pointed acicle) in one layer. Radula monoserial. Ventral

foregut glandular organs of ducts with subepithelially arranged gland cells (type A).

Genus *Macellomenia* Simroth, 1893

Macellomenia Simroth, 1893. *Zeitschrift für wissenschaftliche Zoologie*, 56 (2): 323.

Synonyms: *Paramenia* Pruvot, 1890 (no Bruer and Bergenstam, 1889).

TYPE SPECIES: *Paramenia palifera* Pruvot, 1890.

Mantle without epidermal papillae. With common atrio-buccal opening, or mouth opening and atrium separate. Midgut without constrictions. Sec-

ondary genital opening single. Without copulatory stylets. With receptacula seminis. With dorsoterminal sense organ. With respiratory organs.

Macellomenia palifera (Pruvot, 1890), in *Arch. Zool. Exp. gén., sér. 2*, 8

Paramenia palifera Pruvot, 1890

Holotype: Port Vendres (France); 80 m; (Type material missing).

Literature: Pruvot, 1891, in *Arch. Zool. Exp. gén., sér. 2*, 9. Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Macellomenia aciculata Scheltema, 1999, in *Ophelia*, 51

Holotype: West European Bassin (50°N, 12°W); 2498 m; Mus. Nat. Hist. Nat., Paris, France.

Literature: Scheltema, 1999, in *Ophelia*, 51.

Macellomenia adenota Salvini-Plawen, 2003, in *Iberus*, 21 (2)

Holotype: Strait of Gibraltar, off Ceuta; 25-40 m; Mus. Nat. Hist. Nat. (Malacologie), Paris, France.

Literature: Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Family MEIOMENIIDAE Salvini-Plawen, 1985

Meiomeniidae Salvini-Plawen, 1985. *Stygologia*, 1 (1): 104.

Thin cuticle, sclerites as three or more types of scales in one layer. Radula distichous. Ventral foregut glandular

organs with subepithelially arranged, pairedly accumulated gland cells (clustered type).

Genus *Meiomenia* Morse, 1979

Meiomenia Morse, 1979. *Zoologica Scripta*, 8: 249.

TYPE SPECIES: *Meiomenia swedmarki* Morse, 1979.

Mantle without epidermal papillae. With common atrio-buccal opening. Midgut without constrictions. With

copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Meiomenia swedmarki Morse, 1979, in *Zool. Scripta*, 8

Holotype: Isle of St John (Washington State, USA); 59 m; U.S.Nat.Mus. Washington DC, USA.

Literature: Morse, 1979, in *Zool. Scripta*, 8. Morse, 1994, in *Reproduction and Development of Marine Invertebrates* (J. Hopkins Univ. Press): 195-205. García-Álvarez *et al.*, 2000, in *Argonauta*, XIV (2).

Meiomenia arenicola Salvini-Plawen and Sterrer, 1985, in *Stylogologia*, 1

Holotype: North Carolina (USA); 40-41 m; Bermuda Biol. Station, Bermuda.

Distribution: North Carolina to Florida (USA); 11-41 m.

Literature: Salvini-Plawen, 1985b, in *Stylogologia*, 1. Morse and Norenburg, 1992, in *Proc. Biol. Soc. Washington*, 105. Morse, 1994, in *Reproduction and Development of Marine Invertebrates* (J. Hopkins Univ. Press): 195-205. García-Álvarez *et al.*, 2000, in *Argonauta*, XIV (2).

Genus *Meioherpia* Salvini-Plawen, 1985

Meioherpia Salvini-Plawen, 1985. *Stylogologia*, 1 (1): 105.

TYPE SPECIES: *Meioherpia atlantica* Salvini-Plawen, Rieger and Sterrer, 1985.

Mantle without epidermal papillae.

Mouth opening separate from the atrium. Midgut without constrictions.

Without copulatory stylets. With dorso-terminal sense organ. Without respiratory organs.

Meioherpia atlantica Salvini-Plawen, Rieger and Sterrer, 1985, in *Stylogologia*, 1

Holotype: North Rock (Bermuda); 8 m; Naturhist. Mus. Wien, Austria.

Distribution: Bermuda, Beaufort (North Carolina, USA); 8-30 m.

Literature: Salvini-Plawen, 1985, in *Stylogologia*, 1. García-Álvarez *et al.*, 2000, in *Argonauta*, XIV (2). Todt, 2006, in *Zoomorphology*, 125.

Meioherpia stygalis Salvini-Plawen and Sterrer, 1985, in *Stylogologia*, 1

Holotype: Castle Road, (Bermuda), below the tide-line, Naturhist. Mus. Wien, Austria.

Literature: Salvini-Plawen, 1985, in *Stylogologia*, 1. García-Álvarez *et al.*, 2000, in *Argonauta*, XIV (2).

INCERTA SEDIS 1

Genus *Pholidoherpia* Salvini-Plawen, 1978

Pholidoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 51.

TYPE SPECIES: *Lepidomenia cataphracta* Thiele, 1913.

Thin cuticle; sclerites as scales and solid slender elements in one layer; without epidermal papillae. With common atrio-buccal opening. Radula of monoserial (?) plates. Ventral foregut glandular organs with subepithelially

arranged gland cells opening into and a pair of ampullae (type A). Midgut without constrictions. Secondary genital opening unpaired. Without dorso-terminal sense organ. Presence of Copulatory stylets and respiratory organs unknown.

Pholidoherpia cataphracta (Thiele, 1913), in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Lepidomenia cataphracta Thiele, 1913

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pholidoherpia ctenodonta Handl and Salvini-Plawen, 2001, in *Sarsia*, 86
Holotype: Fillford (Norway); depth unknown; Zool. Mus. Uppsala Univ., Sweden.
Literature: Handl and Salvini-Plawen, 2001, in *Sarsia*, 86.

Pholidoherpia lepidota Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Off Staten Island, Tierra de Fuego (South America); 135-137 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Order NEOMENIAMORPHA Salvini-Plawen, 1978

Neomeniamorpha Salvini-Plawen, 1978. *Zoologica*, 44 (128): 24 [non Neomeniomorpha Pelseneer, 1906].

Members of stout body-shape which lack ventral foregut glandular organs. Sclerites arranged in one layer, exhibiting various solid elements (scales, acicular spicules, groove-like elements with or without lanceolate distal end, short

harpoon-shaped bodies). Cuticle moderate or thick, without or with intruding epidermal papillae. With a complicated copulatory apparatus including two pairs of copulatory stylets and associated glands. With respiratory organs.

Family HEMIMENIIDAE Salvini-Plawen, 1978

Hemimeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 53.

Cuticle thin, in general without epidermal papillae. Sclerites of various elements, among them short harpoon-

shaped bodies with pedestal limited to certain longitudinal areas of the body. Radula polyserial or missing.

Genus *Hemimenia* Nierstrasz, 1902

Hemimenia Nierstrasz, 1902. *The Solenogastres of the Siboga Expedition. Monographie*, 47: 25.
TYPE SPECIES: *Hemimenia intermedia* Nierstrasz, 1902.

Sclerites mainly of scales and solid spicules; short harpoon-shaped bodies present. With common atrio-buccal opening.

Radula missing. Secondary genital openings separate or fused. With dorsoterminal sense organ. With respiratory organs.

Hemimenia intermedia Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47
Holotype: Celebes Islands, Indonesia, (*Siboga* St. 114); 75 m; Zool. Mus. Univ. Amsterdam, Netherlands.
Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 42.

Hemimenia dorsosulcata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: South Pacific; 549 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Hemimenia atlantica Salvini-Plawen, 2006, in *Iberus*, 24 (2)
Holotype: Azores Islands (Atlantic); 1200-1240 m; Mus. Nat. Hist. Nat., Paris, France.

Distribution: Azores to Banco A Quiniela off Galicia (NW Spain); 752-1240 m.

Literature: Salvini-Plawen, 2006, in *Iberus*, 24 (2).

Hemimenia cyclomyata Salvini-Plawen 2006, in *Iberus*, 24 (2)

Holotype: Banco de Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: Salvini-Plawen, 2006, in *Iberus*, 24 (2).

Hemimenia glandulosa Salvini-Plawen, 2006, in *Iberus*, 24 (2)

Holotype: Banco de Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: Salvini-Plawen, 2006, in *Iberus*, 24 (2).

Genus *Archaeomenia* Thiele, 1906

Archaeomenia Thiele, 1906. *Wissenschaftliche Ergebnisse der Deutschen Tiefsee Expedition auf dem Dampfer Valdivia*, 1898-1899, 9 (2): 3.

TYPE SPECIES: *Archaeomenia prisca* Thiele, 1906.

Sclerites mainly as groove-like elements (without lanceolate distal end) and solid needles; short harpoon-shaped bodies present. With common

atrio-buccal opening. With polyserial radula. Secondary genital opening paired. With dorsoterminal sense organ. With respiratory organs.

Archaeomenia prisca Thiele, 1906, in *Wiss. Ergebnisse Dtsch. Tiefsee-Exp. Valdivia* 1898/1899, 9

Holotype: Agulhas Bay, (Soutj Africa); 564 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journ. Mar. Freshwater Res.*, 38.

Archaeomenia nova Scheltema, 1999, in *Ophelia*, 51

Holotype: West Scotland (North Atlantic); 609 m; Mus. Nat. Hist. Nat., Paris, France.

Literature: Scheltema, 1999, in *Ophelia*, 51.

Family NEOMENIIDAE Ihering, 1876

Neomeniidae Ihering, 1876. *Jahrbücher der Deutschen malakozoologischen Gesellschaft*, 3: 137.

Synonyms: Solenopodidae Koren and Danialssen, 1877.

Cuticle thick, epidermal papillae generally present. Sclerites as various solid,

elongate elements; short harpoon-shaped bodies missing. Type of radula unknown.

Genus *Neomenia* Tullberg, 1875

Neomenia Tullberg, 1875. *Bihang Till K. Svenska Vetensk. Akad. Handlingar*, 3 (13): 3.

Synonyms: *Solenopus* Sars, 1868; *Heathimania* Salvini-Plawen, 1967.

TYPE SPECIES: *Neomenia carinata* Tullberg, 1875.

Sclerites as solid acicular spicules, and/or groove-like elements with or without lanceolate distal end, and/or slender scales. With common atrio-

buccal opening. Radula missing. Secondary genital openings separate or fused. With dorsoterminal sense organ. With respiratory organs.

Neomenia carinata Tullberg, 1875, in *Bih. Svenska Akad.*, 3 (13)

Solenopus nitidulus M. Sars, 1869

Solenopus affinis Koren and Danielssen, 1877

Neomenia grandis Thiele, 1894

Holotype: Bohuslän (Sweden); ca. 90 m; (Type material missing).

Distribution: North Sea (Norway to Scotland), Iceland, British Isles, off Roscoff (France), W-Mediterranean Sea to the S-Adriatic Sea; 10-565 m.

Literature: Wirén, 1892, in *Kungl. Svenska Vetensk. Akad. Handl.*, 25 (6). Salvini-Plawen, 1997, in *Iberus*, 15 (2).

Neomenia crenulata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: near Kerguelen Islands (South Indian Ocean); 585 m; Stat. marine d'Endoume, Marseille, France.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Neomenia dalyelli (Kor. and Dan., 1877), in *Arch. Math. Naturvid. (Kristiania/Oslo)*, 2

Solenopus dalyelli Koren and Danielssen, 1877

?*Vermiculus crassus* Dalyell, 1853

Holotype: Søndfjord (Norway); 183 m; Zoologisk Museum Bergen, Norway.

Distribution: Scandinavia Coast, North Sea, Scotland, Iceland; 30-580 m.

Literature: Wirén, 1892, in *Kungl. Svenska Vetensk. Akad. Handl.*, 25 (6). Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journ. mar. Freshwater Res.*, 38.

Neomenia herwigi Kaiser, 1976, in *Mitt. Hamburg. Zool. Mus. Inst.*, 73

Holotype: Argentina; 350 m; Zool. Mus. Inst. Univ Hamburg, Germany.

Literature: Kaiser, 1979, in *Mitt. Hamburg. Zool. Mus. Inst.*, 73.

Neomenia labrosa Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Elephant Island (South Shetland Islands, Antarctica); 220-240 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Neomenia laminata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Orkney Islands (Antarctica); 298-302 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Neomenia megatrapezata Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journ. mar. Freshwater Res.*, 38

Holotype: South Shetland Islands (Antarctica), 640-670 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journ. mar. Freshwater Res.*, 38.

Neomenia microsolen Wirén, 1892, in *Kungl. Svenska Vetensk. Akad. Handl.*, 25 (6)

Holotype: Sta Lucia (W India); 290 m; (Type material missing).

Literature: Wirén, 1892, in *Kungl. Svenska Vetensk. Akad. Handl.*, 25 (6).

Neomenia monolabrosa Salvini-Plawen, 2006, in *Iberus*, 24 (2)

Holotype: Livingston Island (South Shetland Islands, Antarctica); 80 m; Dept. Biol. Ani. University of Santiago de Compostela, Spain.

Literature: García-Álvarez and Urgorri, 2003, in *Iberus*, 21 (1). Salvini-Plawen, 2006, *Iberus*, 24 (2).

Neomenia naevata Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journ. mar. Freshwater Res.*, 38

Holotype: New Zealand; 380-384 m; Portobello Marine Lab (Univ. Otago), New Zealand.

Literature: Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journr. mar. Freshwater Res.*, 38.

Neomenia oscari Salvini-Plawen, 2006, in *Iberus*, 24 (2)

Holotype: Banco de Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: Salvini-Plawen, 2006, in *Iberus*, 24 (2).

Neomenia permagna Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Pacific (ca. 55°S 130°W); 549 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Neomenia proprietecta Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica); 344-351 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Neomenia simplex Salvini-Plawen, 2006, in *Iberus*, 24 (2)

Holotype: Banco de Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: Salvini-Plawen, 2006, in *Iberus*, 24 (2).

Neomenia trapeziformis Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Antipodes Islands (New Zealand); 2010-2110 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Neomenia trivialis Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journr. mar. Freshwater Res.*, 38

Holotype: South Shetland Islands (Antarctica), 640-670 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen and Paar-Gausch, 2004, in *New Zealand Journr. mar. Freshwater Res.*, 38.

Neomenia verilli Heath, 1918, in *Mem. Mus. comp. Zool. Harvard Coll.*, 45 (2)

Heathimenia verrilli (Heath, 1918)

Holotype: Gulf of Saint Lawrence (Canada); 570-575 m; (Type material missing).

Literature: Heath, 1918, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2).

Neomenia yamamotoi Baba, 1975, in *Publ. Seto mar. Biol. Lab.*, 22 (5)

Holotype: Muroran (Hokkaido, Japan); 160-200 m; Mus. Osaka, Japan.

Literature: Baba, 1975, in *Publ. Seto mar. Biol. Lab.*, 22 (5). Ivanov, 1996, in *Ruthenica*, 6.

Supraorder PACHYTEGMENTARIA Salvini-Plawen, 1978

Pachytegmentaria Salvini-Plawen, 1978. *Zoologica*, 44 (128): 24.

The supraorder is characterised by the formation of a generally thick cuticle mostly also enclosing pedunculated epidermal papillae and with one to several layers of mostly acicular sclerites; in case

of thin cuticle, this is combined either with the dominant presence of acicular spicules or with a biserial radula and latero-ventral foregut glandular organs not of so-called type A (as well as with solid sclerites).

Order STERROFUSTIA Salvini-Plawen, 1978

Sterrofustia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 24.

Cuticle generally thick; sclerites acicular partly combined with paddle-shaped or with hook-shaped elements, all solid without internal cavity. Radula

distichous or tetraserial. Ventral foregut glandular organs with subepithelially arranged gland cell bodies (type A or type B).

Family PHYLLOMENIIDAE Salvini-Plawen, 1978

Phyllomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 83.

Radula distichous. Subepithelially arranged gland cell bodies of ventral

foregut glandular organs without peripheral outer musculature (type A).

Genus *Phyllomenia* Thiele, 1913

Phyllomenia Thiele, 1913. *Deutsche Südpolar-Expedition 1901-1903. 14 Zoologie*, 6 (1): 45.

TYPE SPECIES: *Phyllomenia austrina* Thiele, 1913.

With epidermal papillae; solid sclerites acicular and paddle- to oar-shaped in various layers. Mouth separated from the atrium. Midgut with constrictions.

Gonads with true gonoducts. Secondary genital opening paired. With copulatory stylets. Without dorsoterminal sense organ. Without respiratory folds.

Phyllomenia austrina Thiele, 1913 in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Distribution: South Sandwich Islands (Antarctica), Bransfield Strait (Antarctica), Ross Sea (Antarctica), Davis Sea (Antarctica); 148-465 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Phyllomenia cornuadentata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Phyllomenia austrina Thiele in Salvini-Plawen, 1970, *Zeitschr. zool. Syst. Evolut.-forsch.*, 8.

Holotype: Staten Island (Tierra del Fuego, South America); 384-494 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Staten Island (Tierra del Fuego, South America); 384-903 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Harpagoherpia* Salvini-Plawen, 1978

Harpagoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 95.

TYPE SPECIES: *Harpagoherpia tenuisoleata* Salvini-Plawen, 1978.

Cuticle moderately thick, solid acicular sclerites in various layers. Mouth separated from the atrium. Midgut without constrictions. Secondary genital

opening unpaired. Without copulatory stylets. Presence of dorsoterminal sense organ unknown. Without respiratory organs.

Harpagoherpia tenuisoleata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Adelaide Archipelago (South Chile); 92-101 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Lituiherpia* Salvini-Plawen, 1978

Lituiherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 97.

TYPE SPECIES: *Lituiherpia spermathecata* Salvini-Plawen, 1978.

Sclerites acicular combined with hook-shaped and scaly elements, arranged in several layers. With common atrio-buccal opening. Midgut

with constrictions. Without dorsoterminal sense organ. Genital opening unpaired. Without copulatory stylets. Without respiratory organs.

Lituiherpia spermathecata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica); 118 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Sandwich Islands (Antarctica) to Falkland Islands; 40-137 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Ocheyoherpia* Salvini-Plawen, 1978

Ocheyoherpia Salvini-Plawen, 1978. *Zoológica*, 44 (128): 101.

TYPE SPECIES: *Ocheyoherpia lituifera* Salvini-Plawen, 1978.

Cuticle moderately thick, without epidermal papillae; sclerites acicular and hook-shaped in one layer. Mouth opening (in part well separated from atrium but) within common atrio-buccal

opening. Midgut with constrictions. Secondary genital opening unpaired. With copulatory stylets with gland. Without respiratory organs. Without dorsoterminal sense organ.

Ocheyoherpia lituifera Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica); 148-201 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Georgia (South Sandwich Islands, Antarctica), Elefant and Joinville Islands (South Shetland Islands, Antarctica); 97-220 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Ocheyoherpia bursata García-Álvarez and Urgorri, 2003, in *Iberus*, 21 (2)

Holotype: Deception Island (South Shetland Islands, Antarctica); 248 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: García-Álvarez and Urgorri, 2003, in *Iberus*, 21 (2).

Ocheyoherpia kerguelensis Salvini-Plawen, 2005, in *Mitt. Mus. Naturkunde Berlin, Germany, Zool.*, 81 (1)

Holotype: Kerguelen Islands (South Indian); unknown depth; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 2005, in *Mitt. Mus. Naturkunde Berlin, Germany, Zool.*, 81 (1).

Ocheyoherpia trachia Scheltema, 1999, in *Rec. Austral. Mus.*, 51

Holotype: Macquarie Islands (South Pacific); 11 m; Australian Museum, Sidney, Australia.

Distribution: Macquarie Islands (South Pacific); 6,1-14 m.

Literature: Scheltema, 1999, in *Rec. Austral. Mus.*, 51.

Family IMEROHERPIIDAE Salvini-Plawen, 1978

Imeroherpiidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 79.

Radula tetraserial. Ventral foregut glandular organs with subepithelially

arranged gland cell bodies surrounded by musculature (type B).

Genus *Imeroherpia* Salvini-Plawen, 1978

Imeroherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 79.

TYPE SPECIES: *Imeroherpia quadridens* Salvini-Plawen, 1978.

Cuticle thick, with epidermal papillae, with solid acicular sclerites in various layers. With common atrio-buccal opening. Midgut with constrictions.

Secondary genital opening paired. With copulatory stylets with associated gland. With dorsoterminal sense organ. Presence of respiratory organs uncertain.

Imeroherpia quadridens Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Kap Bassin, (South Africa); 2785-2870; South African Museum, Cape Town, South Africa.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Imeroherpia laubieri Handl, 2002, in *J. Moll. Stud.* 68

Holotype: West European Bassin (47° N, 9° W), 2246 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Handl, 2002, in *J. Moll. Stud.*, 68.

Family HETEROERPIIDAE Salvini-Plawen, 1978

Heteroherpiidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 105.

Radula distichous. Ventral foregut glandular organs with subepithelially

arranged gland cell bodies surrounded by musculature (type B).

Genus *Heteroherpia* Salvini-Plawen, 1978

Heteroherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 106.

TYPE SPECIES: *Heteroherpia procera* Salvini-Plawen, 1978.

Cuticle thick, with epidermal papillae, with solid acicular sclerites in various layers. With common atrio-buccal opening. Midgut with constrictions.

Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Heteroherpia procera Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Kap Bassin, (South Africa); 2785-2870 m; South African Museum, Cape Town, South Africa.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Incerta sedis 2

Genus *Rhabdoherpia* Salvini-Plawen, 1978

Rhabdoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 110.

TYPE SPECIES: *Rhabdoherpia ventromusculata* Salvini-Plawen, 1978.

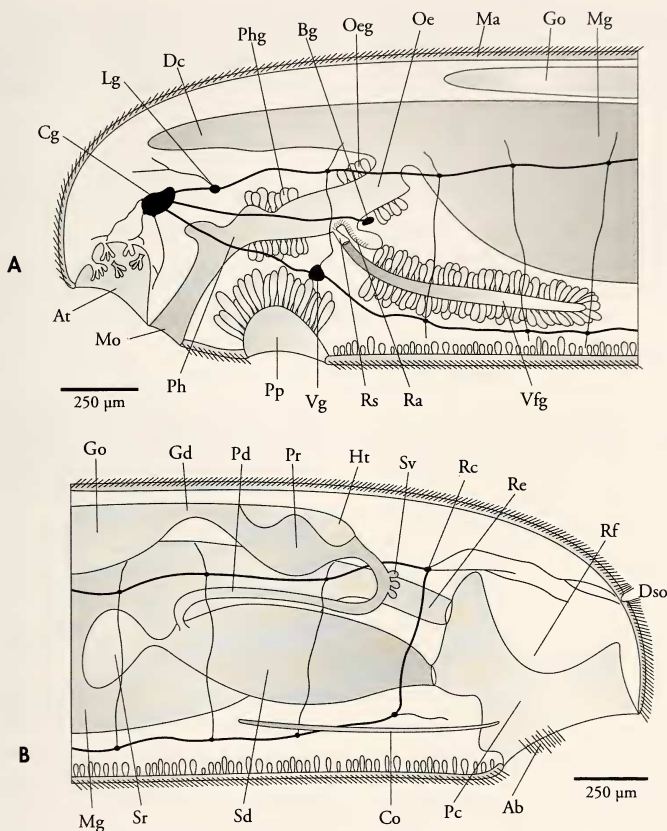


Figure 4. A: schematic organization of the anterior body of Solenogastres; B: schematic organization of the posterior body of Solenogastres. Abbreviations, Ab: abdominal spicule; At: atrial sense organ; Bg: buccal ganglion; Cg: cerebral ganglion; Co: copulatory stylet; Dc: dorsal caecum; Dso: dorsoterminal sense organ; Gd: gonopericardioduct; Go: gonad; Ht: heart; Lg: lateral ganglion; Ma: mantle with sclerites; Mg: midgut; Mo: mouth; Oe: oesophagus; Oeg: oesophageal glands; Pc: pallial cavity; Pd: pericardioduct; Ph: pharynx; Phg: pharynx glands; Pp: pedal pit; Pr: pericardium; Ra: radula; Rc: supra-rectal commissure; Re: rectum; Rf: respiratory fold; Rs: radular sac; Sd: spawning duct; Sr: seminal receptacle; Sv: seminal vesicle; Vfg: Ventral foregut glandular organs; Vg: ventral ganglion.

Figura 4. A: esquema de la organización de la parte anterior de los Solenogastres; B: esquema de la organización de la parte posterior de los Solenogastres. Abreviaturas, Ab: espículas abdominales; At: órgano sensitive atrial; Bg: ganglio bucal; Cg: ganglio cerebral; Co: estilete copulador; Dc: ciego dorsal; Dso: órgano sensitive dorsoterminal; Gd: gonopericardioducto; Go: gónada; Ht: corazón; Lg: ganglio lateral; Ma: manto con escleritos; Mg: intestino; Mo: boca; Oe: esófago; Oeg: glándulas esofágicas; Pc: cavidad paleal; Pd: pericardioducto; Ph: faringe; Phg: glándulas faringeadas; Pp: foseta pedia; Pr: pericardio; Ra: rádula; Rc: comisura suprarrectal; Re: recto; Rf: pliegues respiratorios; Rs: saco radular; Sd: conducto de desove; Sr: receptáculo seminal; Sv: vesícula seminal; Vfg: órganos glandulares ventrales de la faringe; Vg: ganglio ventral.

Sterrofustia with acicular sclerites in various layers; cuticle thick, with epidermal papillae. Mouth opening separate from the atrium. Without radula. Without (?) ventral foregut glandular

organs. Midgut with constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorso-terminal sense organ. With respiratory organs.

Rhabdoherpia ventromusculata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica); 344-351 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Ross Sea (Antarctica); 344-549 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Order CAVIBELONIA Salvini-Plawen, 1978

Cavibelonia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 24.

Predominantly provided with hollow, acicular sclerites in one or several layers within a thick cuticle, or provided with solid sclerites and with a biserial radula combined with latero-ventral foregut glandular organs not of

so-called type A (ducts with subepithelially arranged gland cells). Radula of different types (monoserial, biserial, distichous or polypolystichous-polyserial) or missing. Latero-ventral foregut glandular organs of different types.

Family PRUVOTINIDAE Heath, 1911

Pruvotinidae Heath, 1911. *Memoirs of the Museum of Comparative Zoölogy at Harvard College*, 45 (1): 47.

Synonyms: Parameniidae Simroth, 1893; Paramenidae Pruvot, 1902; Perimeniidae Nierstrasz, 1908 (part); Pruvotiniidae Heath, 1911; Pararrhopaliidae Salvini-Plawen, 1972.

Sclerites acicular with cavity. Radula distichous or missing. With or without hollow, hook-shaped elements, and with or without a dorso-pharyngeal papilla gland, and with or without respiratory organs. Ventral foregut glandu-

lar organs of ducts with subepithelially arranged gland cells (type A), of circumpharyngeal subepithelial-follicular glands, or with epithelial gland cells (type C). Diverse group with subfamilies.

Subfamily PARARRHOPALIINAE Salvini-Plawen, 1978

Pararrhopaliinae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Hollow hook-shaped sclerites present. Ventral foregut glandular

organs of type A. With dorso-pharyngeal papilla gland.

Genus *Pararrhopalia* Simroth, 1893

Pararrhopalia Simroth, 1893. *H.G. Bronn's. Klassen und Ordnungen des Tierreichs*, 3 (1): 232.

Synonyms: *Paramenia* Pruvot, 1890 (part.) (non Brauer and Bergenstamm, 1889).

TYPE SPECIES: *Pararrhopalia pruvoti* Simroth, 1893

Tangential sclerites in two or more layers; with epidermal papillae Mouth separated from the atrium. Distichous radula present. Midgut without regular

constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Pararrhopalia pruvoti Simroth, 1893, in *Zeitschr. wiss. Zool.*, 56

Proneomenia vagans Kow. and Mar. in Puvot, 1891

Holotype: Banyuls-sur Mer (France); 80 m; (Type material missing).

Distribution: Galicia (Spain); 150 m.

Literature: Puvot, 1891, in *Arch. Zool. Exp. gén., sér. 2*, 9. Todt, 2006, in *Zoomorphology*, 125 (3).

Pararrhopalia fasciata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Shetland Islands (Antarctica); 220-240 m; Smithsonian Institution, Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Pruvotina* Cockerell, 1903

Pruvotina Cockerell, 1903. *The Nautilus*, 16 (10): 118

Synonyms: *Paramenia* Puvot, 1890 (part.) (non Brauer and Bergenstamm, 1889); *Perimenia* Nierstrasz, 1908 (part.).

TYPE SPECIES: *Paramenia impexa* Puvot, 1890.

Mouth opening (in part separated from atrium but) within common atrio-buccal opening Distichous radula present. Midgut with constrictions. Se-

condary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Pruvotina impexa (Puvot, 1890), in *Arch. Zool. Exp. gén., sér. 2*, 8

Paramenia impexa Puvot, 1890

Holotype: Banyuls-sur Mer (France); 60-80 m; (Type material missing).

Literature: Puvot, 1891, in *Arch. Zool. Exp. gén., sér. 2*, 9.

Pruvotina cryophila (Pelseneer, 1901), in *Bull. Acad. Belgique*, 9-10

Paramenia cryophila Pelseneer, 1901

Holotype: Bellinghausen Sea (Antarctica); 500-550 m; Inst. Roy. Sci. Nat. Belg., Brussels, Belgium.

Distribution: Bellinghausen Sea, Ross Sea (Antarctica); 342-550 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina gauszi Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina longispinosa Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Drake Strait (South Sandwich Islands, Antarctica); 115 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Shetland Islands (Antarctica), South Sandwich Islands (Antarctica), Adeleide Archipelago (South Chile); ? Bellinghausen Sea; 64-220 m (-3890 m?).

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina megathecata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Staten Island (Tierra del Fuego, South America); 135-137 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Tierra del Fuego, South America; 118-903 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina pallioglandulata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Shetland Islands (Antarctica); 210-220 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina peniculata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Staten Island (Tierra del Fuego, South America); 135-137 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Tierra del Fuego, South America, ?Ross Sea; 119-549 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina praegnans Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica); 148-201 m; Smithsonian Institution (Nat. Mus. Nat. Hist.) DC, USA.

Distribution: South Sandwich Islands (Antarctica), South Shetland Islands (Antarctica); 148-220 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina providens Thiele, 1913, in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Holotype: Gauss Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Pruvotina uniperata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica); 344-351 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Shetland Islands, Bransfield Strait, Ross Sea (Antarctica); 210-2306 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Labidoherpia* Salvini-Plawen, 1978

Labidoherpia Salvini-Plawen, 1978. *Zoológica*, 44 (128): 145.

TYPE SPECIES: *Pruvotina spinosa* Thiele, 1913.

Mouth opening within common atrio-buccal opening Distichous radula present. Midgut with constrictions. Se-

condary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Labidoherpia spinosa (Thiele, 1913), in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Pruvotina spinosa Thiele, 1913

Holotype: Gauss Station (David Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Subfamily ELEUTHEROMENIINAE Salvini-Plawen, 1978

Eleutheromeniinae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Hollow hook-shaped sclerites present. Ventral foregut glandular organs

of type A. Without dorso-pharyngeal papilla gland.

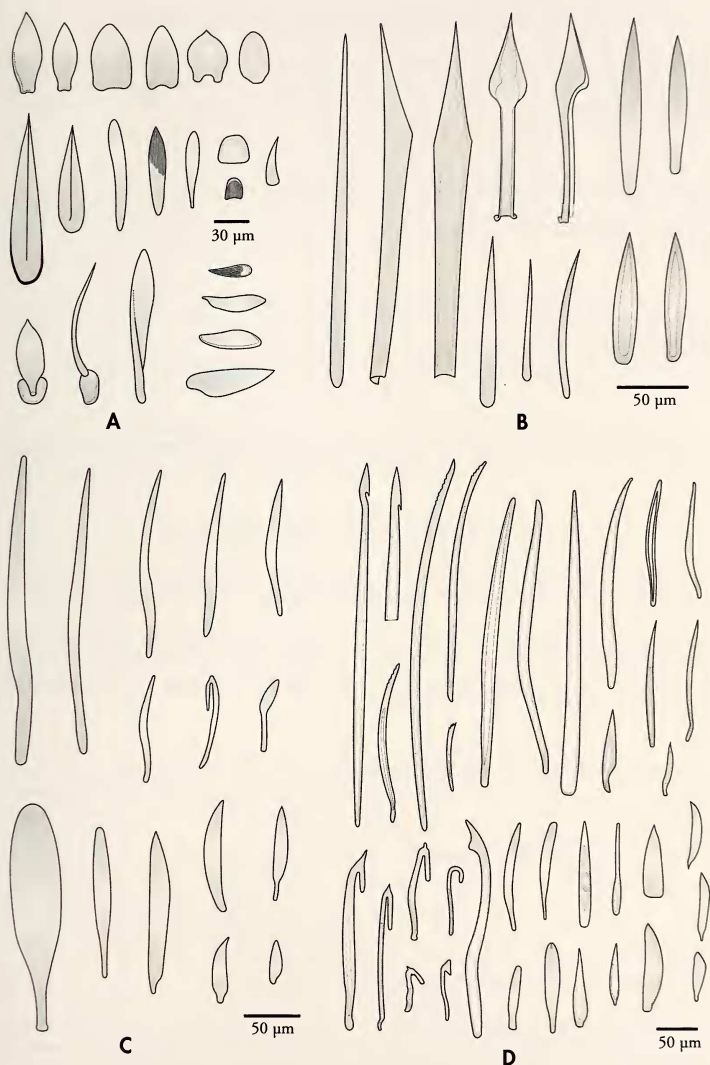


Figure 5. Sclerite types in Solenogastres orders. A: Pholidoskepia; B: Neomeniomorpha; C: Sterrufustia; D: Cavibelonia.

Figura 5. Tipos de escleritos en los órdenes de Solenogastros. A: Pholidoskepia; B: Neomeniomorpha; C: Sterrufustia; D: Cavibelonia.

Genus *Eleutheromenia* Salvini-Plawen, 1967

Eleutheromenia Salvini-Plawen, 1967. *Zeitschrift für zoologischer Systematik und Evolutionsforschung*, 5, S: 428. Synonyms: *Paramenia* Pruvot, 1890 (no Brauer and Bergenstamm, 1889) (part); *Perimenia* Nierstrasz, 1908 (part).

TYPE SPECIES: *Paramenia sierra* Pruvot, 1890.

Without epidermal papillae.
Mouth opening within common atrio-buccal opening Distichous radula present. Midgut with constrictions.

Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Eleutheromenia sierra (Pruvot, 1890), in *Arch. Zool. Exp. gén., sér 2*, 8

Paramenia sierra Pruvot, 1890

Holotype: Costa Brava (Spain), 80 m; (Type material missing).

Distribution: Costa Brava, Roscoff (France), Irish Sea, Trondheim (Norway); 40-128 m.

Literature: Pruvot, 1891, in *Arch. Zool. Exp. Gén., sér 2*, 9. Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Eleutheromenia carinata Salvini-Plawen and Öztürk, 2006, in *Spixiana*, 29

Holotype: Bay of Izmir (Turkey); 75 m; ESFM Museum (Ege University, Faculty of Fisheries) Turkey.

Literature: Salvini-Plawen and Öztürk, 2006, in *Spixiana*, 29.

Genus *Gephyroherpia* Salvini-Plawen, 1978

Gephyroherpia Salvini-Plawen, 1978. *Zoológica*, 44 (128): 114.

TYPE SPECIES: *Gephyroherpia antarctica* Salvini-Plawen, 1978.

Epidermal papillae present.
Mouth opening separated from the atrium Distichous radula present. Midgut with constrictions. Secondary

genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Gephyroherpia antarctica Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica), 342-360 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Ross Sea, Davis-Sea (Antarctica); 342-714 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Luitfriedia* García-Álvarez and Urgorri, 2001

Luitfriedia García-Álvarez and Urgorri, 2001. *Cahiers de Biologie Marine*, 42 (3): 198.

TYPE SPECIES: *Luitfriedia minuta* García-Álvarez and Urgorri, 2001.

Epidermal papillae present. Mouth opening within common atrio-buccal opening. Radula missing. Secondary

genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Luitfriedia minuta García-Álvarez and Urgorri, 2001, in *Cah. Biol. mar.*, 42

Holotype: Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat. Madrid, Spain.

Literature: García-Álvarez and Urgorri, 2001, in *Cah. Biol. mar.*, 42.

Subfamily LOPHOMENIINAE Salvini-Plawen, 1978

Lophomeniinae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Without hook-shaped sclerites.	type A. With dorso-pharyngeal papilla
Ventral foregut glandular organs of	gland.

Genus *Lophomenia* Heath, 1911

Lophomenia Heath, 1911. *Memoirs of the Museum of Comparative Zoologie at Harvard College*, 45 (1): 47.

TYPE SPECIES: *Lophomenia spiralis* Heath, 1911.

Cuticle thick. Mouth opening within common atrio-buccal opening. Distichous radula present. Midgut with constrictions. Secondary genital	opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With (?) respiratory organs.
--	--

Lophomenia spiralis Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)

Holotype: Nilhau Islands (Hawaii) (*Albatross* St. 4176), 100-1200 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Genus *Metamenia* Thiele, 1913

Metamenia Thiele, 1913. *Deutsche Südpolar-Expedition 1901-1903. 14 Zoologie*, 6 (1): 52

TYPE SPECIES: *Metamenia intermedia* Thiele, 1913

Cuticle thick. Mouth opening separated from the atrium. Distichous radula present. Midgut with constrictions. Se-	condary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.
---	---

Metamenia intermedia Thiele, 1913 in *Dtsch. Südpolar-Exp.*, 14 (*Zool.* 6/1)

Holotype: Gauss-Station (Davis-Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.

Distribution: Wilkes Land (Davis-Sea, Antarctica); 293-385 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Metamenia triglandulata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica); 342-360 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Ross Sea; 342-1610 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Hypomenia* Van Lummel, 1930

Hypomenia Van Lummel, 1930. *Zeitschrift für Morphologie und Ökologie der Tiere*, 18: 347.

TYPE SPECIES: *Hypomenia nierstraszi* Van Lummel, 1930.

Cuticle thick. Mouth opening separated from the atrium. Distichous radula present. Midgut without regular constrictions. Secondary genital	opening unpaired. Without copulatory stylets. Without (?) dorsoterminal sense organ. Without respiratory organs.
--	--

Hypomenia nierstraszi Van Lummel, 1930, in *Zeitschr. Morph. Ökol. Tiere*, 18
Holotype: Gulf of Naples (Italy); unknown depth; Mus. Nat. Hist. Leiden, Netherlands.
Distribution: Gulf of Naples (Italy), Monaco; 150-200 m.
Literature: Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3).

Genus *Forcepimania* Salvini-Plawen, 1969

Forcepimania Salvini-Plawen, 1969. *Zoologische Jahrbücher. Abteilung für Systematik, Ökologie and Geographie der Thiere*, 96 (1): 61.

TYPE SPECIES: *Forcepimania protecta* Salvini-Plawen, 1969.

Cuticle thin, without epidermal papillae. Mouth opening separated from the atrium. Distichous radula present. Midgut with constrictions. Secondary	genital opening, presence of copulatory stylets and of respiratory organs unknown. Without dorsoterminal sense organ.
--	---

Forcepimania protecta Salvini-Plawen, 1969, in *Zool. Jahrb. Syst.*, 96
Holotype: Gubal Strait (Hurghada, Red Sea), 30 m; Naturhist. Mus. Wien, Austria.
Literature: Salvini-Plawen, 1969, in *Zool. Jahrb. Syst.*, 96.

Subfamily HALOMENIINAE Salvini-Plawen, 1978

Halomeniinae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Without hook-shaped sclerites. Ventral foregut glandular organs of type	A. Without dorso-pharyngeal papilla gland.
---	--

Genus *Halomenia* Heath, 1911

Halomenia Heath, 1911. *Memoirs of the Museum of Comparative Zoologie at Harvard College*, 45 (1): 47.
TYPE SPECIES: *Halomenia gravida* Heath, 1911.

Mouth opening separated from the atrium. Distichous radula present. Midgut with constrictions. Secondary	genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.
--	--

Halomenia gravida Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: vor Simushir Islands (Kuril Islands) (*Albatross* St.4804), 420 m; Calif. Acad. Sci., San Francisco, USA.
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Subfamily UNCIHERPIINAE García-Álvarez, Urgorri and Salvini-Plawen, 2001

Unciherpiinae García-Álvarez, Salvini-Plawen and Urgorri, 2001. *Journal of Molluscan Studies*, 67 (1): 114.

With or without hook-shaped sclerites. Foregut glandular organs as circumpha-	ryngeal subepithelial-follicular glands. Without dorso-pharyngeal papilla gland.
---	--

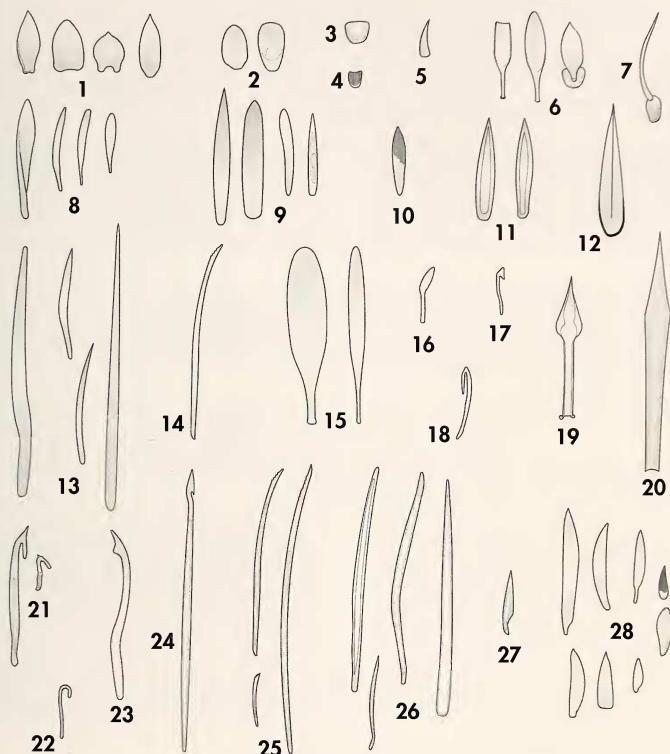


Figure 6. Forms of the sclerites. 1: leaf shaped scales; 2: oval shaped scales; 3: smooth discoidal scales; 4: striated discoidal scales; 5: triangular scales; 6: pallet shape scales; 7: claviform scales; 8: oar shaped scales; 9: smooth laminar scales; 10: striated laminar scales; 11: excavated scales; 12: lanceolate scales with keel; 13: solid acicular sclerites; 14: solid sclerites with serrate end; 15: solid oar shaped sclerites; 16: solid pallet-shaped sclerites; 17: solid axe-shaped sclerites; 18: solid hook-shaped sclerites; 19: solid lanceolate sclerites; 20: solid hollow hook-shaped sclerites pointed at the curvature; 21: pointed hollow hook-shaped sclerites; 22: blunt hook-shaped hollow sclerites; 23: hollow axe-shaped sclerites (captate); 24: hollow harpoon-shaped sclerites; 25: serrated hollow acicular sclerites; 26: hollow acicular sclerites; 27: knife-shaped hollow sclerites; 28: scales of pedal groove.

Figura 6. Formas de los escleritos: 1: escamas en forma de hoja; 2: escamas ovaladas; 3: escamas discoidales lisas; 4: escamas discoidales estriadas; 5: escamas triangulares; 6: escamas en forma de paleta; 7: escamas claviformes; 8: escamas en forma de remo; 9: escamas laminares lisas; 10: escamas laminares estriadas; 11: escamas excavadas; 12: escamas lanceoladas con quilla; 13: escleritos macizos aciculares; 14: escleritos macizos con el extremo aserrado; 15: escleritos macizos en forma de remo; 16: escleritos macizos en forma de paleta; 17: escleritos macizos en forma de hacha; 18: escleritos macizos ganchudos; 19: escleritos macizos con punta de flecha; 20: escleritos macizos lanceolados; 21: escleritos huecos ganchudos apuntados en la curvatura; 22: escleritos huecos ganchudos romos; 23: escleritos huecos en forma de bacha (captate); 24: escleritos huecos en forma de arpón; 25: escleritos aciculares huecos aserrados; 26: escleritos aciculares huecos; 27: escleritos huecos en forma de cuchillo; 28: escamas del surco pedio.

Genus *Uncimienia* Nierstrasz, 1903

Uncimienia Nierstrasz, 1903. *Zoologische Jahrbücher. Abteilung für Anatomie und Ontogenie der Tiere*, 18 (3): 376.

TYPE SPECIES: *Uncimienia neapolitana* Nierstrasz, 1903.

Cuticle thin, without epidermal papillae. Sclerites acicular, hook-shaped without apical prominence, and harpoon-shaped, arranged in one layer. Mouth opening within common atrio-

buccal opening. Radula missing. Secondary genital opening unpaired. Without copulatory stylets. Dorsoterminal sense organ present. With respiratory organs.

Uncimienia neapolitana Nierstrasz, 1903, in *Zool. Jb. Anat.*, 18 (3)

Holotype: Gulf of Naples (Italy); 70 m; Mus. Nat. Hist. Leiden, Netherlands.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128). García-Álvarez, Salvini-Plawen and Ugorri, 2001, in *J. Moll. Stud.*, 67.

Genus *Sialoherpia* Salvini-Plawen, 1978

Sialoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 221.

TYPE SPECIES: *Sialoherpia aculeitecta* Salvini-Plawen, 1978.

Cuticle thick, with epidermal papillae. With hollow and solid acicular sclerites, without hook-shaped elements. Mouth opening separated from atrium but within common atrio-buccal

opening. Radula missing. Secondary genital opening, presence of copulatory stylets and of respiratory organs unknown. With (?) dorsoterminal sense organ.

Sialoherpia aculeitecta Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Drake Strait (South America); 2782-2827 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Unciherpia* García-Álvarez, Salvini-Plawen and Ugorri, 2001

Unciherpia García-Álvarez, Salvini-Plawen and Ugorri, 2001. *Journal of Molluscan Studies*, 67 (1): 114.

TYPE SPECIES: *Unciherpia hirsuta* García-Álvarez, Salvini-Plawen and Ugorri, 2001.

Cuticle thin, with epidermal papillae. Sclerites acicular, hook-shaped, and harpoon-shaped, arranged in one layer. Mouth opening within common atrio-buccal opening. Radula

missing. Midgut with constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Unciherpia hirsuta García-Álvarez, Salvini-Plawen and Ugorri, 2001, in *J. Moll. Stud.*, 67

Holotype: Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat. Madrid, Spain.

Literature: García-Álvarez et al., 2001, in *J. Moll. Stud.*, 67.

Subfamilia incerta

Genus *Scheltema* Salvini-Plawen, 2003

Scheltema Salvini-Plawen, 2003. *Iberus*, 21 (2): 53.

TYPE SPECIES: *Eleutheromenia mimus* Scheltema and Schander, 2000.

Cuticle thick. Hollow sclerites acicular and hook-shaped. Mouth opening within common atrio-buccal opening. Radula distichous. Ventral foregut glandular organs with epithelial gland cells

(type C). Ventral ganglia with a commissural sack. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Scheltema mimus (Scheltema and Schander, 2000), in *Biol. Bull.*, 198

Eleutheromenia mimus Scheltema and Schander, 2000

Holotype: Bass Strait (Tasmania); 140 m; Museum of Victoria, Australia.

Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198. Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Scheltema bassensis (Scheltema and Schander, 2000), in *Biol. Bull.* 198

Eleutheromenia bassensis Scheltema and Schander, 2000

Holotype: Bass Strait (Tasmania); 70 m; Museum of Victoria, Australia.

Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198. Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Family RHOPALOMENIIDAE Salvini-Plawen, 1978

Rhopalomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 158.

Thick cuticle, with epidermal papillae. Sclerites acicular in various layers; neither hook-shaped elements, nor dorso-pharyngeal papilla gland, nor respiratory organs. Radula distichous or

missing. Foregut glandular organs of ducts with subepithelially arranged gland cells (type A) and/or with epithelial glands (type C) with outleading duct.

Genus *Rhopalomenia* Simroth, 1893

Rhopalomenia Simroth, 1893. *Zeitschrift für wissenschaftliche Zoologie*, 56 (2): 322.

TYPE SPECIES: *Proneomenia aglaopheniae* Kowalevsky and Marion, 1887.

Mouth separated from the atrium. Without radula, but sheath may be present. With two pairs of foregut glandular organs: a pair of ducts with subepithelially arranged gland cells

(type A) and a pair with epithelial glands (type C). Midgut with constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ.

Rhopalomenia aglaopheniae (Kow. and Mar., 1887), in *Ann. Mus. Marseille*, 3

Proneomenia aglaopheniae Kowalevsky and Marion, 1887

Rhopalomenia eisigi Thiele, 1894

Holotype: Banyuls-sur-Mer (France); 60-80 m; (Type material missing).

Distribution: South Peloponnese (Greece) to Schottland; 50-137 m.

Literature: Nierstrasz and Stork, 1940, in *Zoologica*, 36 (99). Salvini-Plawen, 1997, in *Iberus*, 15 (2).

García-Álvarez, Urgorri and Cristobo, 2000, in *Iberus*, 18 (1). Eisenhut and Salvini-Plawen, 2006, in *Zootaxa*, 1184.

Rhopalomenia glandulosa Eisenhut and Salvini-Plawen, 2006, in *Zootaxa*, 1184.
Holotype: NW Schottland; 1270 m; National Museum of Scotland, Edinburgh, UK
Literature: Eisenhut and Salvini-Plawen, 2006, in *Zootaxa*, 1184

Genus *Dinomenia* Nierstrasz, 1902

Dinomenia Nierstrasz, 1902. *The Solenogastres of the Siboga Expedition. Monographie*, 47: 11.
TYPE SPECIES: *Dinomenia hubrechtii* Nierstrasz, 1902.

Mouth separated from the atrium.
Radula distichous. Ventral foregut glandular organs as a pair of ducts with subepithelially arranged gland cells

(type A). Midgut with constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ.

Dinomenia hubrechtii Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47
Holotype: Moluccas Sea (Indonesia) (*Siboga* St. 310); 73 m; Zool. Mus. Univ. Amsterdam, Netherlands.
Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47.

Genus *Driomenia* Heath, 1911

Driomenia Heath, 1911. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 45 (1): 45.
TYPE SPECIES: *Driomenia pacifica* Heath, 1911.

Mouth separated from the atrium.
Without radula, but sheath may be present. Foregut glandular organs as a pair of ducts with subepithelially arranged gland cells (type A) only.

Midgut with constrictions. Pericardium with a pair of ventro-anterior diverticles. Secondary genital opening unpaired. Without copulatory stylets. Without dorsoterminal sense organ.

Driomenia pacifica Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: NW Pacific (near Japan); 120-230 m; (Type material missing).
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Genus *Entonomenia* Leloup, 1948

Entonomenia Leloup, 1948. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 24 (37): 1.
Synonyms: *Rhopalomenia* Simroth, 1893 (part).
TYPE SPECIES: *Entonomenia atlantica* Leloup, 1948.

Mouth separated from the atrium.
Without radula, but sheath may be present. Foregut glandular organs as a pair of ducts with subepithelially arranged

gland cells (type A) only. Midgut with constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ.

Entonomenia atlantica Leloup, 1948, in *Bull. Mus. Roy. Hist. nat. Belgique*, 24
Rhopalomenia atlantica (Leloup, 1948)
Holotype: Fuerteventura (Canary Islands, Atlantic); 540 m; Oceanogr. Mus. Monaco.
Literature: Leloup, 1950, in *Résult. Camp. Sc. Monaco*, 110. Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3). Salvini-Plawen, 2003, in *Iberus*, 21 (2). Eisenhut and Salvini-Plawen, 2006, in *Zootaxa*, 1184.

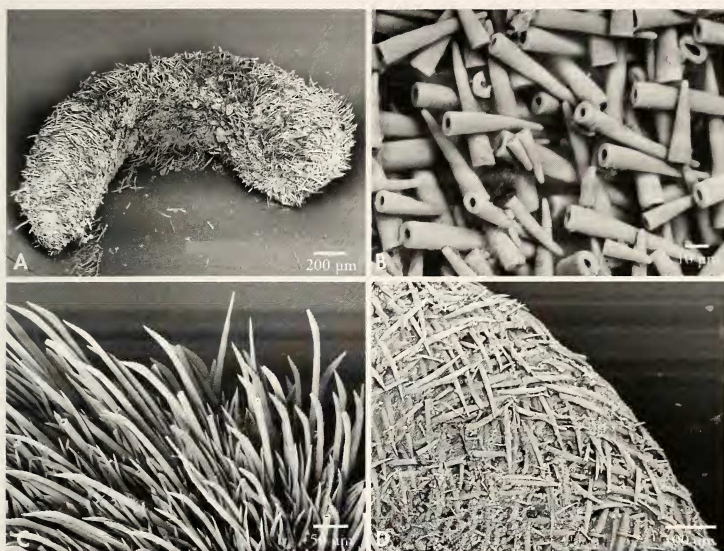


Figure 7. A: microphotograph of *Urgania compostelana*; B: microphotograph of sclerites of *Dorymenia hesperidesi*; C: microphotograph of sclerites of *Unciherpia hirsuta*; D: microphotograph of the mantle with sclerites of *Anamenia gorgonophila*.

Figura 7. A: microfotografía de *Urgania compostelana*; B: Microfotografía de los escleritos en *Dorymenia hesperidesi*; C: microfotografía de los escleritos en *Unciherpia hirsuta*; D: microfotografía del manto con escleritos en *Anamenia gorgonophila*.

Entonomenia carinata (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)

Rhopalomenia carinata Salvini-Plawen, 1978

Holotype: South Georgia (Antarctica); 97-101; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Georgia, South Shetland Islands (Antarctica); 97-220 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128). Salvini-Plawen, 1990, *Lavori S.I.M.*, 23.

García-Álvarez and Urgania, 2003, in *Iberus*, 21 (1).

Entonomenia cristata (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)

Rhopalomenia cristata Salvini-Plawen, 1978

Holotype: South Shetland Islands (Antarctica); 109 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: South Sandwich Islands (Antarctica), South Shetland Islands (Antarctica), Ross Sea, Crozet-Islands; 91-351 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Entonomenia microporata (Handl and Salvini-Plawen, 2002), in *Sarsia*, 87

Rhopalomenia microporata Handl and Salvini-Plawen, 2002

Holotype: Hjeltefjord (Bergen, Norway); unknown depth; Zool. Mus. Univ. Uppsala, Sweden.

Literature: Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Entonomenia rhynchopharyngeata (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)
Rhopalomenia rhynchopharyngeata Salvini-Plawen, 1978
Holotype: South Shetland Islands (Antarctica); 210-220 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Distribution: South Sandwich Islands, South Shetland Islands, Ross Sea (Antarctica); 148-732 m.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128). García-Álvarez and Urgorri, 2003, in *Iberus*, 21 (1).

Entonomenia sertulariicola (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)
Rhopalomenia sertulariicola Salvini-Plawen, 1978
Holotype: South Sandwich Islands (Antarctica); 148-201 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Entonomenia tricarinata (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)
Rhopalomenia tricarinata Salvini-Plawen, 1978
Holotype: South Sandwich Islands (Antarctica); 148-201 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Distribution: South Sandwich Islands, South Georgia, South Shetland Islands, Palmer Archipelago (Bransfield Strait), Ross Sea, Balleney-Islands, Dumont d'Urville-Sea (Antarctica); 97-1444 m.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Pruvotia* Thiele, 1894 (position uncertain)

Pruvotia Thiele, 1894. *Zeitschrift für wissenschaftliche Zoologie*, 58 (2): 272.
TYPE SPECIES: *Proneomenia sopita* Pruvot, 1891.

Sclerites acicular in various layers.
Mouth separated from the atrium.
Without radula, but sheath may be present. Foregut glandular organs unknown. Midgut with constrictions.

Secondary genital opening unpaired.
Without copulatory stylets. Without dorsoterminal sense organ. With two (respiratory ?) folds in the pallial cavity.

Pruvotia sopita (Pruvot, 1891), in *Arch. Zool. Exp. gén., sér. 2*, 9
Proneomenia sopita Pruvot, 1891
Holotype: Banyuls-sur-Mer (France); 45-70 m; (Type material missing).
Literature: Pruvot, 1891, in *Arch. Zool. Exp. gén., sér. 2*, 9.

Genus *Urgorria* García-Álvarez and Salvini-Plawen, 2001

Urgorria García-Álvarez and Salvini-Plawen, 2001. *Sarsia*, 86 (3): 183.
TYPE SPECIES: *Urgorria compostelana* García-Álvarez and Salvini-Plawen, 2001.

Mouth within common atrio-buccal opening. Without radula. Foregut glandular organs with epithelial glands only (type C) with outleading duct.

Midgut with constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ.

Urgorria compostelana García-Álvarez and Salvini-Plawen, 2001, in *Sarsia*, 86
Holotype: Banco de Galicia (NW Spain); 760-769 m; Mus. Nacional Cienc. Nat., Madrid, Spain.
Distribution: Banco de Galicia, Gulf of Cádiz (Spain) (pers. obs. García-Álvarez); 760-769 m.
Literature: García-Álvarez and Salvini-Plawen, 2001, in *Sarsia*, 86.

Urgorria monoplicata Salvini-Plawen, 2003, in *Iberus*, 21 (2)

Holotype: Costa Brava (Spain); 35 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: Salvini-Plawen, 2003, in *Iberus*, 21 (2).

Family ACANTHOMENIIDAE Salvini-Plawen, 1978

Acanthomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Cuticle thin, without epidermal papillae. Sclerites in one layer as hollow acicular spicules and scales. Radula monoserial with a pair of

denticles. Ventral foregut glandular organs as a pair of ducts with subepithelially arranged gland cells (type A).

Genus *Acanthomenia* Thiele, 1913

Acanthomenia Thiele, 1913. *Deutsche Südpolar-Expedition 1901-1913. 14 Zoologie*, 6 (1): 61.

TYPE SPECIES: *Acanthomenia gaussiana* Thiele, 1913.

Mouth opening (in part separated from atrium but) within common atrio-buccal opening. Midgut without constrictions. Secondary genital

opening unpaired. Without copulatory stylets. Without (?) dorsoterminal sense organ. With respiratory folds.

Acanthomenia gaussiana Thiele, 1913 in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)

Holotype: Gauss-Station (Davis Sea, Antarctica); 3398 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Acanthomenia arcuata Scheltema, 1999, in *Ophelia*, 51

Holotype: West European Bassin (47° N, 9° W - 55° N, 13° W); 2897 m; Mus. Nat. Hist. Nat., Paris, France.

Distribution: West European Bassin (47° 29' - 58° N, 9° 34' - 13° 08' W); 2081-4327 m.

Literature: Scheltema, 1999, in *Ophelia*, 51. Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Genus *Amboherpia* Handl and Salvini-Plawen, 2002

Amboherpia Handl and Salvini-Plawen, 2002. *Sarsia*, 87: 427.

TYPE SPECIES: *Amboherpia heterotecta* Handl and Salvini-Plawen, 2002.

Mouth opening within common atrio-buccal opening. Subepithelially arranged glands of foregut glandular organs in groups with long necks surrounded by musculature. Midgut

without constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. Without respiratory folds.

Amboherpia heterotecta Handl and Salvini-Plawen, 2002, in *Sarsia*, 87

Holotype: Korsfjord (Bergen, Norway); 610 m; Zool. Mus. Univ. Bergen, Norway.

Literature: Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Family AMPHIMENIIDAE Salvini-Plawen, 1972

Amphimeniidae Salvini-Plawen, 1972. *Zeitschrift für wissenschaftliche Zoologie*, 184 (3/4): 262.

Cuticle thick; sclerites acicular, arranged in several layers. Radula monoserial or missing; anterio-ventral radula sack (when present) unpaired. Foregut glandular organs as ramified

ducts with terminally arranged clusters of gland cells (= type D), generally opening pre-radularly. Spawning ducts with subepithelially arranged, intercellularly opening glands.

Genus *Amphimения* Thiele, 1894

Amphimения Thiele, 1894. *Zeitschrift für wissenschaftliche Zoologie*, 58 (2): 244.

TYPE SPECIES: *Proneomения neapolitana* Thiele, 1889.

Epidermal papillae present. Mouth opening within common atrio-buccal opening. Radula present. Pre-radular outlet of foregut glandular organs without cone.

Midgut without constrictions. Secondary genital opening unpaired. Without copulatory stylets. Without dorsoterminal sense organ. Without respiratory organs.

Amphimения neapolitana (Thiele, 1889), in *Zeitschr. wiss. Zool.*, 49 (3)

Proneomения neapolitana Thiele, 1889

Holotype: Gulf of Naples (Italy); 30-35 m; Museum für Naturkunde, Berlin, Germany.

Literature: Nierstrasz and Stork 1940 in *Zoologica*, 36 (99).

Genus *Proparamения* Nierstrasz, 1902

Proparamения Nierstrasz, 1902. *The Solenogastres of the Siboga Expedition. Monograph* 47: 18.

TYPE SPECIES: *Proparamения bivalens* Nierstrasz, 1902.

Epidermal papillae present. Mouth within common atrio-buccal opening. Radula present. pre-radular outlet of foregut glandular organs into pouch with cone. Midgut

constrictions unknown. Secondary genital opening unpaired. Without copulatory stylets. Without dorsoterminal sense organ. With respiratory organs.

Proparamения bivalens Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47

Holotype: Java (Indonesia) (*Siboga* St.320); 82 m; Zool. Mus. Univ. Amsterdam, Netherlands.

Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47.

Genus *Alexandromения* Heath, 1911

Alexandromения Heath, 1911. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 45 (1): 47.

TYPE SPECIES: *Alexandromения agassizi* Heath, 1911.

Epidermal papillae present. Sclerites in two main sizes; Mouth within common atrio-buccal cavity. Radula present. Pre-radular outlet of foregut glandular organs into pouch with

cone; midgut with constrictions. Secondary genital opening unpaired; without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

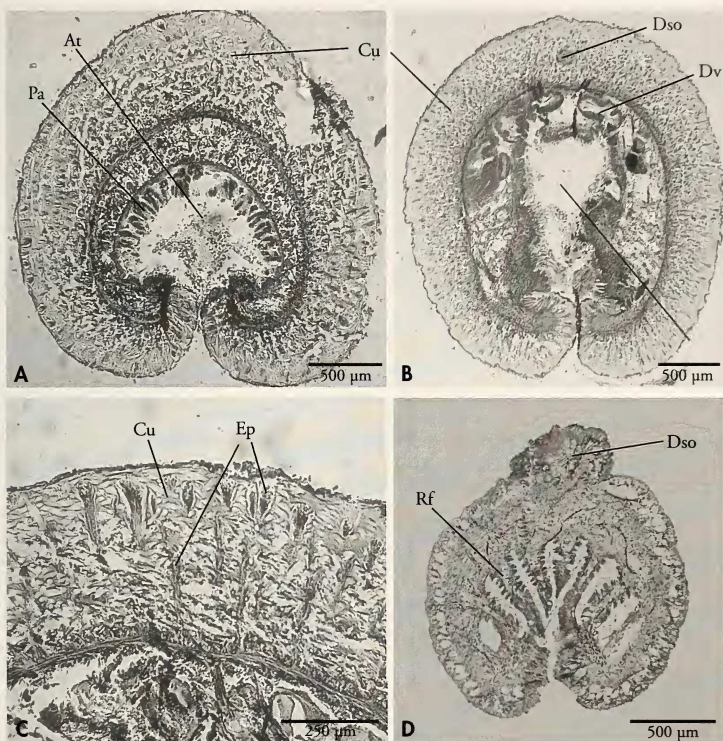


Figure 8. A: microphotograph through the atrium in *Dorymenia menchuescribanae*; B: microphotograph through the pallial cavity in *Dorymenia menchuescribanae*; C: microphotograph of the cuticle in *Dorymenia menchuescribanae*; D: microphotograph through the pallial cavity in *Hemimenia* sp. Abbreviations, At: atrium; Cu: cuticle; Dso: dorsoterminal sense organ; Dv: diverticle; Ep: epidermal papilla; Pa: papilla; Pc: pallial cavity; Rf: respiratory fold.

Figura 8. A: microfotografía del atrio en *Dorymenia menchuescribanae*; B: microfotografía de la cavidad paleal en *Dorymenia menchuescribanae*; C: microfotografía de la cutícula en *Dorymenia menchuescribanae*; D: microfotografía de la cavidad paleal en *Hemimenia* sp. Abreviaturas, At: atrio; Cu: cutícula; Dso: órgano sensitivo dorsoterminal; Dv: divertículo; Ep: papila epidérmica; Pa: papila; Pc: cavidad paleal; Vg: ganglios ventrales; Rf: pliegue respiratorio.

Alexandromenia agassizi Heath, 1911 in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: Near Revillagigedo Islands (W Pacific, Mexico) (*Albatross* St. 2992); 840 m; Calif. Acad. Sci., San Francisco, USA.
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Alexandromenia acuminata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Scotia Sea (Antarctica); 2886-3040 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Alexandromenia antarctica Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Bransfield Strait (Antarctica); 662-1120 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Alexandromenia (?) *crassa* Odhner, 1921, in *Bergens Mus. Aarb.* 1918/19, 3

Holotype: Färöskallen, Hjeltefjord (Bergen, Norway); 100-200 m; Svenska Mus. Nat. Hist., Stockholm, Sweden.

Literature: Odhner, 1921, in *Bergens Mus. Aarb.* 1918/19, 3. Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Alexandromenia grimaldii Leloup, 1946, in *Bull. Mus. Roy. Hist. nat. Belgique*, 22 (16)

Holotype: Azores Islands (Atlantic); 1250 m; Oceanograph. Mus. Monaco.

Literature: Leloup, 1950, in *Résult. Camp. Sc. Monaco*, 110. Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3).

Alexandromenia latosoleata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Pacific; 459 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Alexandromenia pilosa Handl and Salvini-Plawen, 2002, in *Sarsia*, 87

Holotype: Trondheimsfjord (Nowey); 180-240 m; Zool. Mus. Univ. Copenhagen, Denmark.

Literature: Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Alexandromenia valida Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)

Holotype: California (USA) (*Albatross* St. 4282); 1100-2500 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Genus *Pachymenia* Heath, 1911

Pachymenia Heath, 1911. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 45 (1): 45.

TYPE SPECIES: *Pachymenia abyssorum* Heath, 1911.

Epidermal papillae present. Mouth within common atrio-buccal cavity. Radula missing. Pre-radular outlet of foregut glandular organs into pouch with cone; midgut

without constrictions. Secondary genital opening unpaired; without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Pachymenia abyssorum Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)

Holotype: California (USA) (*Albatross* St. 4397); 4018-4077 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Genus *Spengelomenia* Heath, 1912

Spengelomenia Heath, 1912. *Zoologische Jahrbücher. Supplement* 15 (1): 465.

TYPE SPECIES: *Spengelomenia bathybia* Heath, 1912.

Epidermal papillae present. Mouth within common atrio-buccal cavity. Radula present. Pre-radular outlet of foregut glandular organs into pouch with cone; midgut

without constrictions. Secondary genital opening unpaired; without copulatory stylets. Without dorsoterminal sense organ. With respiratory organs.

Spengelomenia bathybia Heath, 1912 in *Zool. Jb.*, Suppl. 15

Holotype: Florida (USA); 1500-2000 m; (Type material missing).

Literature: Heath 1912 in *Zool. Jb.*, Suppl. 15.

Spengelomenia intermedia Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Drake Strait (South Shetland Islands, Antarctica); 2672-3020 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Spengelomenia procera Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Drake Strait (Palmer Archipelago, Antarctica); 2763-2818 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Spengelomenia polypapillata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Scotia Sea (near South Georgia, Antarctica); 2869-3038 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Paragymnomenia* Leloup, 1947

Paragymnomenia Leloup, 1947. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 23 (35): 1.

TYPE SPECIES: *Paragymnomenia richardi* Leloup, 1947.

Epidermal papillae present. Sclerites in two main types. Mouth within common atrio-buccal cavity. Radula present. Pre-radular outlet of foregut glandular organs into pouch with cone;

midgut without constrictions. Secondary genital opening unpaired; without copulatory stylets. With several dorsoterminal sense organs. With respiratory organs.

Paragymnomenia richardi Leloup, 1947, in *Bull. Mus. Roy. Hist. Nat. Belgique*, 23

Holotype: Cap Martin (Monaco); 46-60 m; Oceanogr. Mus. Monaco.

Literature: Leloup, 1950, in *Résult. Camp. Sc. Monaco*, 110. Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3).

Genus *Meromenia* Leloup, 1949

Meromenia Leloup, 1949. *Bulletin Institut royal des Sciences naturelles de Belgique*, 25 (1): 1.

TYPE SPECIES: *Meromenia hironellei* Leloup, 1949.

Epidermal papillae present. Organs of anterior body unknown. Midgut without constrictions. Secondary genital

opening unpaired; without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Meromenia hironellei Leloup, 1949, in *Bull. Inst. Roy. Sci. nat. Belgique*, 25 (1)

Holotype: N Bay of Biscay (W Atlantic); 166 m; Oceanograph. Mus. Monaco.

Literature: Leloup, 1950, in *Résult. Camp. Sc. Monaco*, 110. Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3).

Genus *Plathymenia* Schwabl, 1961

Plathymenia Schwabl, 1961. *Zoologischer Anzeiger*, 167 (3/4): 113.

TYPE SPECIES: *Plathymenia branchiosa* Schwabl, 1961.

Without epidermal papillae. Mouth within common atrio-buccal cavity. Radula missing. Ventral foregut glandular organs small with simple outlet, not pre-radular;

midgut with constrictions. Secondary genital opening unpaired; without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Plathymenia branchiosa Schwabl, 1961 in *Zool. Anz.*, 167

Holotype: California (USA); 730 m; Los Angeles County Museum, USA.

Literature: Schwabl, 1961, in *Zool. Anz.*, 167; 1963, in *Pacific Science*, 17.

Genus *Sputoherpia* Salvini-Plawen, 1978

Sputoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 193.

TYPE SPECIES: *Sputoherpia fissitubata* Salvini-Plawen, 1978.

Epidermal papillae present. Mouth within common atrio-buccal cavity. Radula present. Pre-radular outlet of foregut glandular organs into pouch with cone; midgut

with constrictions. Secondary genital opening unpaired; without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Sputoherpia fissitubata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Kerguelen Islands (South Indian Ocean); 3025 m; Station marine d'Endoume, Marseille, France.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Sputoherpia exigua Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Pacific; 567-604 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Sputoherpia galliciensis García-Álvarez, Urgorri and Salvini-Plawen, 2000, in *Ophelia*, 53

Holotype: Galicia (NW Spain); 752 m; Mus. Nacional Cienc. Nat. Madrid, Spain.

Literature: García-Álvarez, Urgorri and Salvini-Plawen, 2000, in *Ophelia*, 53 (3).

Sputoherpia laxopharyngeata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Kap Bassin, (South Africa); 3157-3257 m; South African Museum, Cape Town, South Africa.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Sputoherpia megaradulata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Scotia Sea (near South Georgia, Antarctica); 2886-3040 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Utralvoherpia* Salvini-Plawen, 1978

Utralvoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 204.

TYPE SPECIES: *Utralvoherpia abyssalis* Salvini-Plawen, 1978.

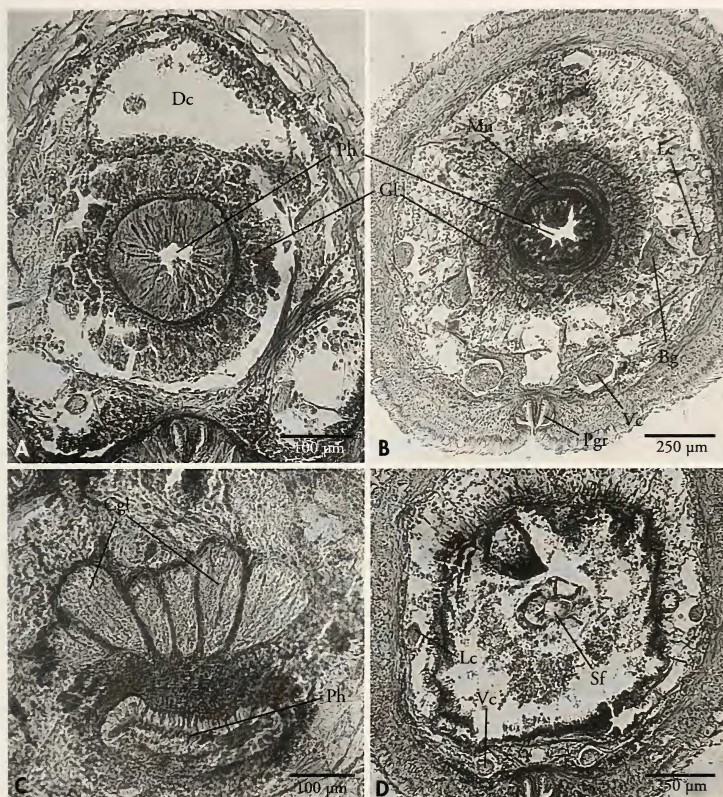


Figure 9. A: microphotograph through the pharynx and the dorsal caecum in *Anamenia gorgonophila*; B: microphotograph through the pharynx and nerve cords in *Neomenia monolabrosa*; C: microphotograph through the pharynx and circumpharyngeal glands in *Unciherpia hirsuta*; D: microphotograph through the pharynx sphincter of *Neomenia monolabrosa*. Abbreviations, Bg: bucal ganglion; Cgl: circumpharyngeal glands; Dc: dorsal caecum in the midgut; Gl: gland; Lc: lateral nervous cord; Mu: musculature; Pgr: pedal groove; Ph: pharynx; Sf: sphincter; Vc: ventral nerve cord.

Figura 9. A: microfotografía de la faringe y ciego dorsal en *Anamenia gorgonophila*; B: microfotografía de la faringe y cordones nerviosos en *Neomenia monolabrosa*; C: microfotografía de la faringe y glándulas circumfaringeas en *Sputoherpia galliciensis*; D: microfotografía del esfínter de la faringe en *Neomenia monolabrosa*. Abreviaturas, Bg: ganglio bucal; Cgl: glándulas circumfaringeas; Dc: ciego dorsal del intestino; Gl: glándula; Lc: cordón nervioso lateral; Mu: musculatura; Ph: faringe; Sf: esfínter; Vc: cordón nervioso ventral.

Epidermal papillae present. Sclerites of two sizes. Mouth within common atrio-buccal cavity. Radula present. Pre-radular outlet of foregut glandular organs into pouch

with cone; midgut without constrictions. Secondary genital opening unpaired; without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Ultravohерpia abyssalis Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Orkney Trench (Antarctica); 5259-5274 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Family SIMROTHIELLIDAE Salvini-Plawen, 1978

Simrothiellidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Sclerites hollow-acicular or solid-elongate to scaly. Radula biserial (rows of paired denticulate radula plates or bars); antero-ventral radula sack (when present) paired. Lateroventral

foregut glandular organs with various configuration, but not of the so-called type A (i.e. subepithelially arranged gland cells with outleading ducts).

Genus *Simrothiella* Pilsbry, 1898

Simrothiella Pilsbry, 1898. *Manual of Conchology*, 17: 296.

Synonyms *Solenopus* Sars, 1869 (part).

TYPE SPECIES: *Solenopus margaritaceus* Koren and Danielssen, 1877.

Thick cuticle with epidermal papillae. With hollow acicular sclerites in various layers. Mouth within common atrio-buccal cavity. Radula plates with lateral reinforcement (buttress) and heterogeneous denticulation with elongate lateral denticle; with paired antero-ventral radula sack. Lateroventral

foregut glandular organs bulbous with elongate epithelial glands interspersed by low supporting cells (modified type C). Midgut with moderate constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Simrothiella margaritacea (Kor. and Dan., 1877), in *Arch. Math. Nat. vidensk*, 2

Solenopus margaritaceus Koren and Danielssen, 1877

Holotype: Boknfjord (Kvitingsoy, Stavanger, Norway); 75-115 m; Zoologisk Museum Bergen, Norway (2 Syntypes); Swedish Mus. Nat. Hist. Stockholm, Sweden (Odhner description).

Distribution: Galicia (Spain) (*Simrothiella* cf. *margaritacea*); 800 m.

Literature: Odhner, 1921, in *Bergens Mus. Aarbok 1918/1919*, 3. Opinion 1185 in *Bull. Zool. Nomencl.*, 38. Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70. Todt, 2006, in *Zoomorphology*, 125 (3).

Simrothiella abyssaeuropaea Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70

Simrothiella margaritacea (part.) in Scheltema and Schander, 2000, in *Biol. Bull.* 198.

Holotype: West European Bassin (51° N, 13° W); 2173 m; Nat. Mus. Nat. Hist., Washington DC, USA. Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198. Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Simrothiella comorensis Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3)

Holotype: Mozambique Channel, (Indian Ocean); 3716 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3).

Simrothiella digitoradulata Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70

Holotype: Atacama Trench (N Chile); 1927-1997 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Genus *Cyclomenia* Nierstrasz, 1902

Cyclomenia Nierstrasz, 1902. *The Solenogastres of the Siboga Expedition*, 47: 29.

TYPE SPECIES: *Cyclomenia holoserica* Nierstrasz, 1902.

Thick cuticle, without epidermal papillae. With hollow acicular sclerites in various layers. Mouth separated from the atrium. Radula plates wide with small denticles. Ventral foregut glandular organs

globular with epithelial gland cells (type C). Midgut without constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Cyclomenia holoserica Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47

Holotype: Timor-See (Indonesia) (*Siboga* St. 300); 918 m; Zool. Mus. Univ. Amsterdam, Netherlands.

Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47; 1905, in *Zool. Jahrb. Abt. Anat.*, 21.

Genus *Krappomenia* Nierstrasz, 1903

Krappomenia Nierstrasz, 1903. *Lo Bianco: Mittheilungen aus der zoologischen Satation zu Neapel*, 16: 249.

TYPE SPECIES: *Krappomenia minima* Nierstrasz, 1903.

Cuticle moderately thick, epidermal papillae present. With hollow acicular sclerites in various layers. Mouth within common atrio-buccal cavity. Radula plates simply serrate; with paired antero-ventral radula sac. Ventral

foregut glandular organs with elongate epithelial gland cells (type C). Midgut with moderate constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs

Krappomenia minima Nierstrasz, 1903, in *Lo Bianco in Mitt. Stat. Neapel*, 16

Holotype: Gulf of Naples (Italy); 950-1100 m; Mus. Nat. Hist. Leiden, Netherlands.

Literature: Nierstrasz and Stork, 1940, in *Zoologica*, 36 (99). Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Krappomenia borealis Odhner, 1921, in *Bergens Mus. Aarbok 1918/1919*, 3

Holotype: Sunde (Hardangerfjord, Norway); (2 syntypes); depth unknown; Zool. Mus. Univ. Oslo, Norway and Svenska Mus. Nat. Hist. Stockholm, Sweden.

Distribution: Norwegen to NW Spain; 110-835 m..

Literature: García-Álvarez, Salvini-Plawen and Urgorri, 2001, in *Iberus*, 19. Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Krappomenia delta Scheltema and Schander, 2000, in *Biol. Bull.*, 198

Holotype: West European Bassin; 4307 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198.

Krappomenia levis Scheltema and Schander, 2000, in *Biol. Bull.*, 198

Holotype: West European Bassin; 4327 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198.

Krappomenia macrodoryata Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3)

Holotype: Mozambique Channel, (Indian Ocean); 3716 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3).

Krappomenia nanodentata Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3)

Holotype: Mozambique Channel, (Indian Ocean); 520-830 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3).

Kruppomenia rhynchota (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)
Simrothiella rhynchota Salvini-Plawen, 1978

Holotype: South Pacific; 3694 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Biserramenia* Salvini-Plawen, 1967

Biserramenia Salvini-Plawen, 1967. *Zeitschrift für Morphologie und Ökologie der Tiere*, 59 (3): 321.

TYPE SPECIES: *Biserramenia psammobionta* Salvini-Plawen, 1967.

Cuticle thin; without epidermal papillae. With hollow acicular sclerites in one layer. Mouth separated from the atrium. Radula plates simply serrate. Ventral foregut glandular organs with

epithelial gland cells (type C). Midgut without constrictions. Secondary genital opening unpaired. Without copulatory stylets. Without dorsoterminal sense organ. Without respiratory organs.

Biserramenia psammobionta Salvini-Plawen, 1967, in *Zeitschr. Morph. Ökol. Tiere*, 59
Holotype: Roscoff (France) 8-10 m; Naturhist. Mus. Wien, Austria, N°. 77160.

Distribution: Galicia (NW Spain), Bretagne, Plymouth; Irish Sea; 8-30 m.

Literature: Salvini-Plawen, 1997, in *Iberus*, 15 (2). García-Álvarez *et al.*, 2000, in *Argonauta*, XIV (2).

Genus *Birasoherpia* Salvini-Plawen, 1978

Birasoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 217.

TYPE SPECIES: *Birasoherpia trisialota* Salvini-Plawen, 1978.

Cuticle thick, with epidermal papillae. With hollow acicular sclerites in various layers. Mouth within common atrio-buccal cavity. Radula plates with heterogeneous denticles, with paired anterio-ventral radula sack. With post-

buccal epithelial glandular organs, ventral foregut glandular organs absent. Midgut with constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Birasoherpia trisialota Salvini-Plawen, 1978, in *Zoologica* 44 (128)

Holotype: Cape Basin, (South Africa), 2785-2870 m; South African Museum, Cape Town, South Africa.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Helicoradomenia* Scheltema and Kuzirian, 1991

Helicoradomenia Scheltema and Kuzirian, 1991. *The Veliger*, 34 (2): 196.

TYPE SPECIES: *Helicoradomenia juani* Scheltema and Kuzirian, 1991.

Cuticle thick. With solid acicular sclerites in one layer. Mouth within common atrio-buccal cavity. Radula plates with few large denticles, with paired anterio-ventral radula sack. Foregut glandular organs as two accumulated groups of long-necked, subepithelially

arranged gland cells (clustered type) with proximal musculature. Midgut with moderate constrictions. Secondary genital opening unpaired. With copulatory stylets. With a dorsofrontal sensory pit and with dorsoterminal sense organ. With respiratory organs.

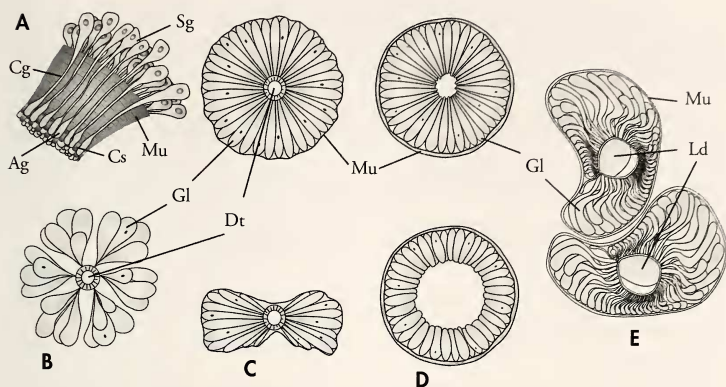


Figure 10. Ventral foregut glandular organs types of Solenogastres. A: accumulated groups of cell bodies subepithelially arranged opening directly into the foregut (type clustered); B: duct surrounded by glandular cells or subepithelial glandular follicles (type A); C: duct with subepithelial glandular cells wrapped by connective tissue or muscular fibres (type B); D: tubular organs or in blister shaped full of epithelial glandular cells and only covered by a muscular wrapping (type C; type *Simrothiella*); E: lateral partly ramified tubes, with subepithelial follicles of glandular cells packed distally (type D). Abbreviations, Ag: glandular cell apex; Cg: glandular cell neck; Cs: supporting cell; Dt: duct; Gl: gland; Ld: lateral duct; Mu: musculature; Sg: glandular cell soma (A: HANDL AND TODT, 2005; B-D: SALVINI-PLAWEN, 1978).

Figura 10. Tipos de órganos glandulares ventrales de la faringe de Solenogastros. A: acumulaciones de cuerpo celulares subepiteliales que se abren directamente en la (tipo clustered); B: conducto rodeado por células glandulares o folículos glandulares subepiteliales (tipo A); C: conducto con células glandulares subepiteliales envuelto por tejido conectivo o fibras musculares (tipo B); D: órgano tubular o en forma de ampolla lleno de células glandulares epiteliales o sólo cubierto por una envoltura muscular (tipo C; tipo *Simrothiella*); E: tubos laterales en parte ramificados con folículos subepiteliales de células glandulares empaquetadas distalmente (tipo D de *Amphimeniidae*). Abreviaturas, Ag: ápice de la célula glandular; Cg: cuello de la célula glandular; Cs: célula de soporte; Dt: conducto; Gl: glándula; Ld: conducto lateral; Mu: musculatura; Sg: cuerpo de la célula glandular. (A: HANDL AND TODT, 2005; B-D: SALVINI-PLAWEN, 1978).

Helicoradomenia juani Scheltema and Kuzirian, 1991, in *The Veliger*, 34

Holotype: Juan de Fuca Ridge (Pacific, USA); 2250 m; Nat. Mus. Nat. Hist, Washington DC, USA.

Distribution: Eastern and western Pacific, hydrothermal vents; 1800-3271 m.

Literature: Scheltema, 2000, in *Argonauta*, 14 (2).

Helicoradomenia acredema Scheltema, 2000, in *Argonauta*, 14 (2)

Holotype: East Pacific Rise (Mexico); 2600 m; Nat. Mus. Nat.Hist., Washington DC, USA.

Distribution: East Pacific (Central America); 2400-3362 m.

Literature: Scheltema, 2000, in *Argonauta*, 14 (2).

Helicoradomenia bisquama Scheltema, 2000, in *Argonauta*, 14 (2)

Holotype: East Pacific Rise (Mexico); 2633 m; Nat. Mus. Nat.Hist., Washington DC, USA.

Literature: Scheltema, 2000, in *Argonauta*, 14 (2).

Genus *Plawenia* Scheltema and Schander, 2000

Plawenia Scheltema and Schander, 2000. *The Biological Bulletin*, 198: 138.

TYPE SPECIES: *Simrothiella schizoradulata* Salvini-Plawen, 1978.

Cuticle moderately thick, without epidermal papillae. With hollow acicular sclerites in one layer. Mouth within common atrio-buccal cavity. Radula plates with lateral reinforcement (buttress), with heterogeneous denticles; with paired antero-ventral

radula sack. Ventral foregut glandular organs with epithelial gland cells (type C). Midgut with moderate constrictions. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Plawenia schizoradulata (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)

Simrothiella schizoradulata Salvini-Plawen, 1978

Holotype: South Shetland Islands (Drake Strait, Antarctica); 4748 m; Nat. Mus. Nat. Hist., Washington DC, USA.

Distribution: South Shetland Islands (Drake Strait, Antarctica) and Atacama Trench (N Chile); 4758-5931 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128). Scheltema and Schander, 2000, in *Biol. Bull.*, 198.

Plawenia argentinensis Scheltema and Schander, 2000, in *Biol. Bull.*, 198

Holotype: Argentina Bassin; 4382 m; Nat. Mus. Nat. Hist., Washington DC, USA.

Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198.

Plawenia sphaera Scheltema and Schander, 2000, in *Biol. Bull.*, 198

Holotype: West European Bassin; 2091 m; Nat. Mus. Nat. Hist., Washington DC, USA.

Literature: Scheltema and Schander, 2000, in *Biol. Bull.*, 198.

Genus *Spiomenia* Arnofsky, 2000

Spiomenia Arnofsky, 2000. *The Veliger*, 43 (2): 110.

TYPE SPECIES: *Spiomenia spiculata* Arnofsky, 2000.

Cuticle thick, without epidermal papillae. With hollow acicular sclerites of two or more types in one layer, several with a distal asymmetrical enlargement (captate). Mouth within common atrio-buccal cavity. Radula plates with lateral reinforcement (buttress), with heterogeneous denticles;

with paired antero-ventral radula sack. Ventral foregut glandular organs ampullar with epithelial gland cells (type C). Midgut configuration not known. Secondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Spiomenia spiculata Arnofsky, 2000, in *The Veliger*, 43 (2)

Holotype: West European Bassin; 2897 m; Mus. Nat. Hist. Nat., Paris, France.

Distribution: West European Bassin; 2040-4307 m.

Literature: Arnofsky, 2000, in *The Veliger*, 43 (2).

Spiomenia praematura Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3)

Holotype: Mozambique Channel, (Indian Ocean); 1480 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Todt and Salvini-Plawen, 2003, in *The Veliger*, 46 (3).

Spioenia phaseolosa Todt and Salvini-Plawen, 2003, in *The Veliger* 46 (3)

Holotype: Mozambique Channel, (Indian Ocean); 3716 m; Mus. Nat. Hist. Nat. Paris, France.

Literature: Todt and Salvini-Plawen, 2003, in *The Veliger* 46 (3).

Genus *Aploradoherpia* Salvini-Plawen, 2004

Aploradoherpia Salvini-Plawen, 2004. *Journal of Molluscan Studies*, 70: 83.

TYPE SPECIES: *Aploradoherpia insolita* Salvini-Plawen, 2004.

Cuticle moderately thick, without epidermal papillae. With hollow acicular sclerites in one layer. Mouth within common atrio-buccal cavity. Radula plates with few simple denticles. Ventral foregut glandular organs

with epithelial gland cells (type C). Midgut without regular constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Aploradoherpia insolita Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70

Holotype: Atacama Trench (N Chile); 1863-1965 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Family DREPANOMENIIDAE Salvini-Plawen, 1978

Drepanomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Hollow acicular sclerites in a single layer. Radula type unknown. Ventral foregut glandular organs with epithelial

gland cells (type C). Midgut with constrictions. Without seminal receptacles. With respiratory organs.

Genus *Drepanomenia* Heath, 1911

Drepanomenia Heath, 1911. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 45 (1): 44.

TYPE SPECIES: *Drepanomenia vampyrella* Heath, 1911.

Cuticle thick, with epidermal papillae; sclerites arranged fairly radially. Mouth within common atrio-buccal cavity. Radula missing. Midgut with

constrictions. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. With respiratory organs.

Drepanomenia vampyrella (Heath, 1905), in *Zool. Jahrb. Anat.*, 21 (4)

Neomenia vampyrella Heath, 1905

Holotype: Oahu Islands (Hawaii) (*Albatross* St. 3907); 555-575 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Coll. Harvard Coll.*, 45 (1).

Drepanomenia incrustata (Kor. and Dan., 1877), in *Arch. Math. og Naturvid. (Oslo)*, 2 (2)

Solenopus incrustatus Koren and Danielssen, 1877

Holotype: Hasvik (Finmarken, Norway); 365-550 m; Svenska Mus. Nat. Hist. Stockholm.

Literature: Odhner, 1921, in *Bergens Aarb.* 1918/19, 3.

Drepanomenia perticata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Ross Sea (Antarctica); 1883-1890 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Drepanomenia pontisquamata Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70

Holotype: SE Canada; 403 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Drepanomenia tenuitecta Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70

Holotype: near New Zealand; 531-659 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Family STROPHOMENIIDAE Salvini-Plawen, 1978

Strophomeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Cuticle thick; hollow acicular sclerites arranged in several layers. Radula pectinate (monoserial to divided-biserial) or missing. Ventral foregut glandular organs with a paired outleading

duct, the intercellularly opening subepithelial gland cells being surrounded by an outer musculature (type B). Seminal receptacles in bundles. Without respiratory organs.

Genus *Strophomenia* Pruvot, 1899

Strophomenia Pruvot, 1899. *Archives de zoologie expérimentale et générale*, 3^a série, 7: 489.

TYPE SPECIES: *Strophomenia lacazei* Pruvot, 1899.

Epidermal papillae often pseudoeptithelially arranged. Mouth within common atrio-buccal cavity. Radula missing. Midgut with constrictions. Sec-

ondary genital opening paired or fused. Without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Strophomenia lacazei Pruvot, 1899, in *Arch. Zool. Exp. gén.*, sér. 3, 7

Holotype: La Calle (Algeria); Litoral; (Type material missing).

Literature: Pruvot, 1899, in *Arch. Zool. Exp. gén.*, sér. 3, 7.

Strophomenia debilis (Nierstrasz, 1902), in *Siboga-Exp. Monogr.*, 47

Rhopalomenia debilis Nierstrasz, 1902

Holotype: Buton Strait (Indonesia) (*Siboga* St. 204); 90 m; Zool. Mus. Univ. Amsterdam, Netherlands.

Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47.

Strophomenia indica (Nierstrasz, 1902), in *Siboga-Exp. Monogr.*, 47

Rhopalomenia indica Nierstrasz, 1902, non *S. indica* in Nierstrasz and Stork, 1940 (= spec.nov.)

Holotype: Kei Islands (Indonesia) (*Siboga* St. 265 and 262) (?); 304-560 m; (Syntype) Zool. Mus. Univ. Amsterdam, Netherlands.

Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47.

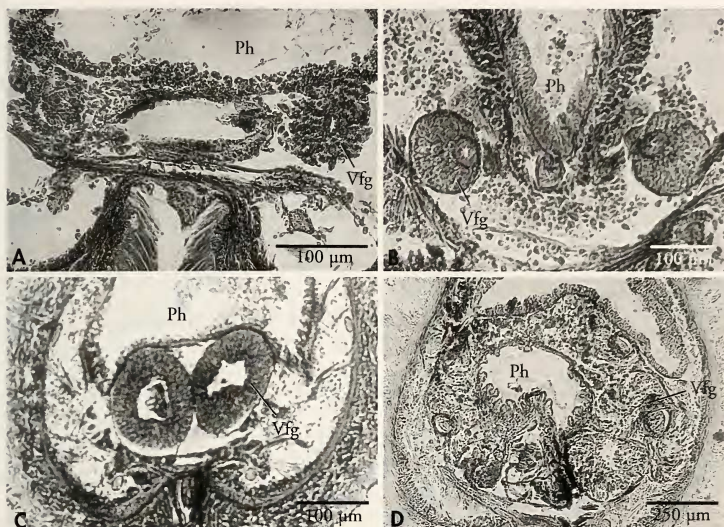


Figure 11. A: microphotograph through the subepithelial ventral foregut glandular organs (type A) in *Rhopalomenia aglaopheniae*; B: microphotograph through the subepithelial-epithelial ventral foregut glandular organs (type B) in *Anamenia gorgonophila*; C: microphotograph through the epithelial ventral foregut glandular organs (type C) in *Dorymenia menchuescribanae*; D: microphotograph through the ramified ventral foregut glandular organs (type D) in *Sputoherpia galliciensis*. Abbreviations, Ph: pharynx; Vfg: ventral foregut glandular organs.

Figura 11.- A: microfotografías de los órganos glandulares ventrales de la faringe subepiteliales (tipo A) en *Rhopalomenia aglaopheniae*; B: microfotografías de los órganos glandulares ventrales de la faringe subepiteliales-epiteliales (tipo B) en *Anamenia gorgonophila*; C: microfotografías de los órganos glandulares ventrales de la faringe epiteliales (tipo C) en *Dorymenia menchuescribanae*; D: microfotografías de los órganos glandulares ventrales de la faringe con tubos laterales ramificados (tipo D) en *Sputoherpia galliciensis*. Abreviaturas, Ph: faringe; Vfg: órganos glandulares ventrales de la faringe.

Strophomenia ophidiana Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: Honshu Islands (Japan) (*Albatross* St. 3755); 95-140 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Strophomenia regularis Heath, 1911 in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: Honshu Islands (Japan) (*Albatross* St. 3717), 130-180 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Strophomenia scandens (Heath, 1905), in *Zool. Jb. Anat.*, 21 (4)

Rhopalomenia scandens Heath, 1905

Holotype: Bird Islands (Hawaii) (*Albatross* St. 4156); 625-1035 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Genus *Anamenia* Nierstrasz, 1908

Anamenia Nierstrasz, 1908. *National Antarctic Expedition 1901-1904. Natural History*. 4. Zoology: 11. Synonyms: *Solenopus* Sars, 1868 (part.).

TYPE SPECIES: *Proneomenia amboinensis* Thiele, 1902.

Epidermal papillae often pseudoepithelially arranged. Mouth within common atrio-buccal cavity. Radula present, pectinate. Midgut with constrictions.

Secondary genital opening generally paired. Without copulatory stylets. With dorsoterminal sense organ (s). Without respiratory organs.

Anamenia amboinensis (Thiele, 1902), in *Denkschrift med.-naturwiss. Ges. Jena*, 8
Proneomenia amboinensis Thiele, 1902

Holotype: Amboina (Banda Sea, Indonesia); unknown depth; Museum für Naturkunde, Berlin, Germany.

Literature: Thiele, 1913, in *Das Tierreich*, 38.

Anamenia agassizi (Heath, 1918), in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2)
Strophomenia agassizi Heath, 1918

Holotype: Cape Cod (Massachusetts, USA); 745-1240 m; (Type material missing).

Literature: Heath 1918 in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2).

Anamenia borealis (Kor. and Dan., 1877), in *Arch. Math. og Naturvid. (Oslo)*, 2 (2)
Solenopus borealis Koren and Danielssen, 1877

Holotype: Vadsø (Norway), depth unknown; Zoologisk Museum, Bergen, Norway.

Distribution: Baffin-Bucht (W- Greenland), North Sea, Norway; 70-1200 m.

Literature: Odhner, 1921, in *Bergens Mus. Aarb.* 1918/19, 3.

Anamenia farcimen (Heath, 1911), in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Strophomenia farcimen Heath, 1911

Holotype: Honshu Islands (Japan) (*Albatross* St. 3748), 130-365 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1). Thiele, 1913, in *Das Tierreich*, 38.

Anamenia gorgonophila (Kowalewski, 1880), in *Zool. Anz.*, 3
Neomenia gorgonophila Kowalevsky, 1880

Proneomenia nierstraszi Stork, 1940

Anamenia heathi Leloup, 1947

Holotype: East Algeria (Mediterranean Sea); depth unknown; (Type material missing).

Neotype: Gorringer Bank (WSW Cape Sao Vicente, Portugal); 65-90 m (Sta. 2731); (Holotype of *A. heathi* Leloup, 1947, *Oceanograph. Mus. Monaco*) herein designated by the junior author following arguments presented in SALVINI-PLAWEN (1972b) and considering the need of stabilizing the name by reference to a detailed anatomical description.

Distribution: West Mediterranean to Azores and to Galicia (Spain); 65-845 m.

Literature: Leloup, 1950, in *Résult. Camp. Sc. Monaco*, 110. Salvini-Plawen, 1972, in *Zeitschr. zool. Syst. Evolut.-forsch.*, 10 (3). García-Álvarez, Ugorri and Cristobo, 1999, in *Nova Acta Cient. Compostelana*, 9.

Anamenia spinosa (Heath, 1911), in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Strophomenia spinosa Heath, 1911

Holotype: Misaki (Honshu Islands, Japan) (*Albatross* St. 4935/4936/3748), 130-365 m; Calif. Acad. Sci., San Francisco, USA.

Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1). Thiele, 1913, in *Das Tierreich*, 38.

Anamenia triangularis (Heath, 1911), in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Strophomenia triangularis Heath, 1911
 Holotype: Honshu Islands (Japan) (*Albatross St.* 3716/4935/4936), 120-230 m; *Calif. Acad. Sci.*, San Francisco, USA.
 Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1). Thiele, 1913, in *Das Tierreich*, 38.

Family PRONEOMENIIDAE Simroth, 1893

Proneomeniidae Simroth, 1893. H. G. Bronn's *Klassen und Ordnungen des Tierreichs*, 3 (1): 225; non Proneomenidae Mitchell, 1892 (cf. Salvini-Plawen, 2004).

Cuticle thick; hollow acicular sclerites arranged in several layers. Radula polystichous-polyserial. Ventral foregut	glandular organs with epithelial gland cells (type C). One pair of seminal receptacles.
--	---

Genus *Proneomenia* Hubrecht, 1880

Proneomenia Hubrecht, 1880. *Zoologischer Anzeiger*, 3: 589.
 TYPE SPECIES: *Proneomenia sluiteri* Hubrecht, 1880.

With epidermal papillae. Mouth within common atrio-buccal cavity. Midgut with constrictions. Secondary	genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ (s). Without respiratory organs.
--	---

Proneomenia sluiteri Hubrecht, 1880, in *Zool. Anz.*, 3
Proneomenia langi Simroth, 1893
 Holotype: Barents Sea; 200-292 m; (Type material missing). Paratype: Mus. Comp. Zoology Harvard Univ.
 Distribution: Spitzbergen, Barents Sea, Kara Sea to Laptev Sea; 45-300 m.
 Literature: Hubrecht, 1881, in *Niederl. Arch. Zool.*, 9 (1). Heuscher, 1892, in *Jena. Zeitschr. Nat.-wiss.*, 27. Thiele, 1932, in *Fauna arctica* (Römer and Schaudinn), 6 (IV).

Proneomenia acuminata Wirén, 1892 in *Kungl. Svenska Vetensk. Akad. Handl.*, 25 (6)
 Holotype: W Indian Ocean; 550 m; (Type material missing).
 Distribution: Straits of Florida, Martha's Vineyard and Mantucket (USA); 250-650 m.
 Literature: Heath, 1918, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2).

Proneomenia desiderata Kowalevsky and Marion, 1887, in *Ann. Mus. Marseille*, 3 (1)
 Holotype: Marseille (France); 20-30 m; (Type material missing).
 Literature: Kowalevsky and Marion, 1887, in *Ann. Mus. Marseille*, 3 (1).

Proneomenia epibionta Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
 Holotype: near Falkland Islands (SW Atlantic); 646-845 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
 Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Proneomenia gerlachei Pelseneer, 1901, in *Bull. Acad. Belgique*, 9-10
 Holotype: Bellinhausen Sea (Antarctica); 550 m; Inst. Roy. Sci. Nat. Belg., Brussels, Belgium.
 Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Proneomenia hawaiiensis Heath, 1905, in *Zool. Jb. Anat.*, 21 (4)
 Holotype: Kauai Islands (Hawaii) (*Albatross St.* 4001); 300-500 m; *Calif. Acad. Sci.*, San Francisco, USA.

Distribution: Mokuhoonoki Islet and Molokai Island (Hawaii) (Albatross St. 3864); 270-330 m.
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Proneomenia insularis Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: Modu Manu (Vogel Islands, Hawaii) (Albatross St. 4157); 1400-1800 m; Calif. Acad. Sci., San Francisco, USA.
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Proneomenia praedatoria Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Kerguelen Islands (S Indian Ocean); 585 m; Station marine d'Endoume, Marseille, France.
Distribution: S Indian Ocean and Drake Strait (South Sandwich Islands, Antarctica); 585-1240 m.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Proneomenia stillerythroclytica Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Falkland Islands (SW Atlantic); 512-586 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Proneomenia valdiviae Thiele, 1902, in *Wiss. Ergebnisse Dtsch. Tiefsee-Exp. Valdivia 1898/1899*, 3
Holotype: Zanzibar (East Africa); 748 m; Museum für Naturkunde, Berlin, Germany, Moll. 105 406.
Literature: Thiele, 1902, in *Wiss. Ergebnisse Dtsch. Tiefsee-Exp. Valdivia 1898/1899*, 3.

Genus *Dorymenia* Heath, 1911

Dorymenia Heath, 1911. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 45 (1): 46.
TYPE SPECIES: *Dorymenia acuta* Heath, 1911.

With epidermal papillae. Mouth within common atrio-buccal cavity. Midgut with regular constrictions. Secondary genital	opening unpaired. With copulatory stylets. With dorsoterminal sense organ(s). Without respiratory organs.
---	--

Dorymenia acuta Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1)
Holotype: Santa Barbara Islands (California, USA) (Albatross St. 4415); 550-1150 m; Calif. Acad. Sci., San Francisco, USA.
Literature: Heath, 1911, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (1).

Dorymenia acutidentata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Bransfield Strait (Graham-Land, Antarctica); 494-507 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC.
Distribution: Bransfield Strait (Antarctica), South Shetland Islands (Antarctica); 494-1437 m.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia antarctica (Thiele, 1913), in *Dtsch. Südpolar-Exp.*, 14 (Zool. 6/1)
Proneomenia antarctica Thiele, 1913; non *P. antarctica* Thiele in Hoffman, 1947/1949, = *Dorymenia hoffmani* Salvini-Plawen, 1978.
Holotype: Gauss Station (Davis Sea, Antarctica), 385 m; Museum für Naturkunde, Berlin, Germany.
Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia cristata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
Holotype: Bransfield Strait (Graham-Land, Antarctica); 884-935 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

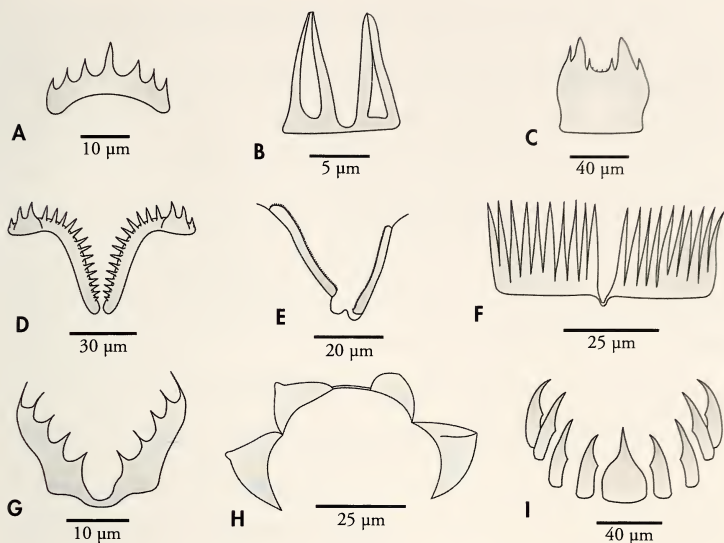


Figure 12. Radula types of Solenogastres. Monoserial, A: *Macellomenia adenota*; B: *Nematomenia flavens*; C: *Sputoherpia galliciensis*. Biserial, D: *Spiomenia praematura*; E: *Kruppomenia borealis*. Pectinate, F: *Anamenia gorgonophila*. Distichous, G: *Tegulaherpia myodoryata*. Tetraseriate, H: *Imeroherpia laubieri*. Polystichous, I: *Dorymenia troncosoi*. (A: SALVINI-PLAWEN, 2003b; B: SALVINI-PLAWEN, 1978; C: GARCÍA-ÁLVAREZ ET AL., 2000; D: TODT AND SALVINI-PLAWEN, 2003; E: GARCÍA-ÁLVAREZ ET AL., 2001; F: SALVINI-PLAWEN, 1972b; G: HANDL AND SALVINI-PLAWEN, 2001; H: HANDL, 2002; I: GARCÍA-ÁLVAREZ ET AL., 1998).

Figura 12. Tipos de rádula en Solenogastros. Monoseriada, A: *Macellomenia adenota*; B: *Nematomenia flavens*; C: *Sputoherpia galliciensis*. Biseriada, D: *Spiomenia praematura*; E: *Kruppomenia borealis*. Pectinada, F: *Anamenia gorgonophila*. Dística, G: *Tegulaherpia myodoryata*. Tetraseriada, H: *Imeroherpia laubieri*. Polística, I: *Dorymenia troncosoi*. (A: SALVINI-PLAWEN, 2003b; B: SALVINI-PLAWEN, 1978; C: GARCÍA-ÁLVAREZ ET AL., 2000; D: TODT AND SALVINI-PLAWEN, 2003; E: GARCÍA-ÁLVAREZ ET AL., 2001; F: SALVINI-PLAWEN, 1972b; G: HANDL AND SALVINI-PLAWEN, 2001; H: HANDL, 2002; I: GARCÍA-ÁLVAREZ ET AL., 1998).

Distribution: Bransfield Strait, South Shetland Islands, Ross Sea (Antarctica); 311-1437 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia discoveryi (Nierstrasz, 1908), in *Nat. Antarctic Exp. 1901-1904*, *Nat. Hist.*, 4
Proneomania discoveryi Nierstrasz, 1908

Holotype: Ross Sea (Antarctica); 180-185 m; Brit. Mus. Nat. Hist. London, UK.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia harpagata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Macquarie Islands (South Pacific); 86-101 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia hesperidesi García-Álvarez, Urgorri and Salvini-Plawen, 2000, in *J. mar. biol. Ass. UK*, 80

Holotype: Livingston Islands (South Shetland Islands, Antarctica); 235 m; Mus. Nacional Cienc. Nat., Madrid, Spain.

Literature: García-Álvarez, Urgorri and Salvini-Plawen, 2000, in *J. mar. biol. Ass. UK*, 80.

Dorymenia hoffmani Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Pronomenia antarctica Thiele in Hoffman, 1947/1949

Holotype: Weddel Sea (Antarctica); 125 m; Univ. Zool. Mus. Uppsala, Sweden.

Distribution: Antarctica-Subantarctica; 75-549 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia interposita Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Sandwich Islands (Antarctica), 118 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia longa (Nierstrasz, 1902), in *Siboga-Exp. Monogr.*, 47

Pronomenia longa Nierstrasz, 1902

Holotype: Sunda-Sea (Indonesia) (*Siboga* St. 211); 1150 m; Zool. Mus. Univ. Amsterdam, Netherlands.

Literature: Nierstrasz, 1902, in *Siboga-Exp. Monogr.*, 47.

Dorymenia menchuescribanae García-Álvarez, Urgorri and Salvini-Plawen, 2000, in *J. mar. biol. Ass. UK*, 80

Holotype: Livingston Islands (South Shetland Islands, Antarctica); 50 m; Mus. Nacional. Cienc. Nat., Madrid, Spain.

Literature: García-Álvarez *et al.*, 2000, in *J. mar. biol. Ass. UK*, 80.

Dorymenia parvidentata García-Álvarez and Urgorri, 2003, in *Iberus*, 21 (1)

Holotype: Livingston Islands (South Shetland Islands, Antarctica); 80 m; Mus. Nacional. Cienc. Nat., Madrid, Spain.

Literature: García-Álvarez and Urgorri, 2003, in *Iberus*, 21 (1).

Dorymenia paucidentata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Palmer Archipelago (Graham Land, Antarctica); 49 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Graham Land (Antarctica), False Bay (South Africa); 49-426 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia peroneopsis Heath, 1918, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2)

Holotype: North America (West Atlantic); 3200 m; (Type material missing).

Literature: Heath, 1918, in *Mem. Mus. Comp. Zool. Harvard Coll.*, 45 (2).

Dorymenia profunda Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Amundsen Sea (Antarctica); 2426-2635 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Distribution: Amundsen Sea (Antarctica); 2416-4795 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia (Doryherpia) quincarinata (Ponder, 1970), in *J. Malacol. Soc. Australia*, 2 (1)

Pronomenia quincarinata Ponder, 1970

Holotype: E New Zealand, 238 m; Dominion Museum, Wellington, New Zealand.

Distribution: New Zealand; 14-238 m.

Literature: Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Dorymenia sarsii (Kor. and Dan., 1877), in *Arch. Math. og Naturvid. (Oslo)*, 2 (2)
Solenopus sarsii Koren and Danielssen, 1877
Dorymenia sarsi Auct.;
Dorymenia tortilis Scheltema and Schander, 2000
 Holotype: Oslofjord (Norway); 190-225 m; Svenska Mus. Nat. Hist., Stockholm and Zoologisk Museum, Bergen, Norway.
 Distribution: Scandinavia, Bay of Biscay (pers. obs. Salvini-Plawen), Gorringe Bank (Cap Sao Vicente, Portugal); 164-681 m.
 Literature: Handl and Salvini-Plawen, 2002, in *Sarsia*, 87.

Dorymenia singulatidentata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
 Holotype: Bransfield Strait (Graham-Land, Antarctica); 662-1120 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
 Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia tetradoryata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
 Holotype: Ross Sea (Antarctica); 909-923 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
 Distribution: Ross Sea (Antarctica); 344-923 m.
 Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia tricarinata (Thiele, 1913), in *Dtsch. Sudpolar-Exp.*, 14 (Zool. 6/1)
Proneomenia tricarinata Thiele, 1913
 Holotype: Gauss-Station (Davis Sea, Antarctica); 385 m; Museum für Naturkunde, Berlin, Germany.
 Distribution: Antarctica - Subantarctica; 187-385 m.
 Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia troncosoi García-Álvarez, Urgorri and Salvini-Plawen, 1998, in *Polar Biol.*, 20
 Holotype: Livingston Islands (South Shetland Islands, Antarctica); 66 m; Mus. Nacional. Cienc. Nat., Madrid.
 Distribution: South Shetland Islands (Antarctica); 65-240 m.
 Literature: García-Álvarez, Urgorri and Salvini-Plawen, 1998, in *Polar Biol.*, 20.

Dorymenia usarpi Salvini-Plawen, 1978, in *Zoologica*, 44 (128)
 Holotype: Ross Sea (Antarctica); 344-351 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.
 Distribution: South Orkney Islands (Antarctica), Bransfield Strait, Ross Sea (Antarctica); 311-732 m.
 Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Dorymenia vagans (Kor. and Mar., 1887), in *Ann. Mus. Hist. Nat. Marseille*, Zool. III (1)
Proneomenia vagans Kowalevsky and Marion, 1887; non *Proneomenia vagans* Kow. and Mar. in Pruvot, 1891 (= *Pararrhopalia pruvoti* Simroth)
 Holotype: Marseille (France); 20 m; (Type material missing); Neo-Holotype: Gulf of Neaples (Italy); Zool. Mus. Univ. Amsterdam, Netherlands.
 Distribution: Marseille (France), Neapel, Livorno (Italy); 20-60 m.
 Literature: Nierstrasz and Strork, 1940, in *Zoologica*, 36 (99).

Dorymenia weberi (Nierstrasz, 1902), in *Siboga-Exp. Monogr.*, 47
Proneomenia weberi Nierstrasz, 1902
 Holotype: Java Sea (Indonesia) (*Siboga* St. 314); 694 m; Zool. Mus. Univ. Amsterdam, Netherlands.
 Literature: Nierstrasz 1902 in *Siboga-Exp. Monogr.*, 47.

Family EPIMENIIDAE Salvini-Plawen, 1978

Epimeniidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 25.

Cuticle thick; hollow acicular sclerites arranged in several layers. Radula distichous to biserial. Ventral foregut

glandular organs with epithelial gland cells (type C). Seminal receptacles in bundles.

Genus *Epimenia* Nierstrasz, 1908

Epimenia Nierstrasz, 1908. *National Antarctic Expedition 1901-1904. Natural History*. 4. Zoology: 11.
TYPE SPECIES: *Proneomenia australis* Thiele, 1897.

With epidermal papillae. Mouth within common atrio-buccal cavity. Ventral foregut glandular organs with pre-radular outlet. Midgut without regular constrictions. With a pair of pha-

ryngeal ganglia, buccal ganglia vestigial. Secondary genital opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Epimenia australis (Thiele, 1897), in *Zool. Anz.*, 20

Proneomenia australis Thiele, 1897

Dinomenia verrucosa Nierstrasz, 1902, non in Baba 1938-1950 (= *E. babai* Salvini-Plawen)

Holotype: Timor Sea (Indonesia); 110 m; Museum für Naturkunde, Berlin, Germany.

Distribution: Indonesia (Timor Sea, Banda Sea, W Flores), Papua Neu Guinea; 15-110 m.

Literature: Salvini-Plawen 1997 in *J. Moll. Stud.*, 63. Scheltema and Jebb, 1994, in *J. Natural Hist.*, 28.

Epimenia allohaemata Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63

Holotype: Korea Strait; 165 m; Zool. Mus. Copenhagen, Denmark.

Literature: Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63.

Epimenia arabica Salvini-Plawen and Benayahu, 1991, in *Marine Ecology*, 12 (2)

Holotype: Tiran-Strait (Sinai-Peninsula, Red Sea); 5 m; Zool. Mus. Tel Aviv Univ, Israel.

Distribution: off Sinai-Peninsula, Hurghada (pers. obs. Salvini-Plawen); 2-23 m.

Literature: Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63.

Epimenia babai Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63

E. verrucosa (Nierstrasz) in Baba, 1938, non *Dinomenia verrucosa* Nierstrasz, 1902 (= *E. australis* (Thiele, 1897))

Holotype: Tomioka / Amakusa (Kyushu, Japan), 40-60 m; Amakusa Mar. Biol. Lab., Kyushu, Japan.

Distribution: Tomioka / Amakusa to Nomo / Nagasaki (Kyushu, Japan); 40-92 m.

Literature: Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63.

Epimenia indica Salvini-Plawen, 1978, in *J. Moll. Stud.*, 63

Holotype: Nilandu Atoll (Maldives Islands, Indian Ocean), 2-66 m; Brit.Mus.Nat.Hist London, UK.

Literature: Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63.

Epimenia ohshimai Baba, 1940, in *Venus*, 2

Holotype: Tomioka / Amakusa (Japan), 40-60 m; (Type material missing).

Literature: Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63.

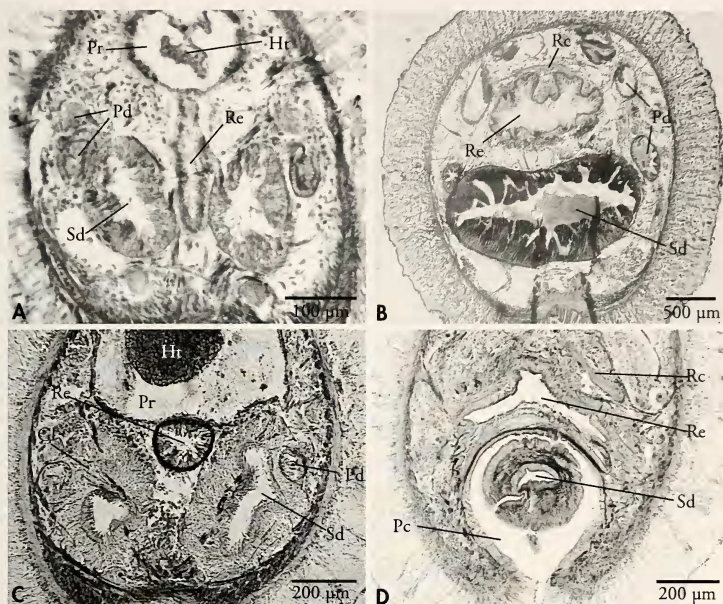


Figure 13. Microphotographs of cross section through the reproductive system. A: *Anamenia gorgonophila*; B: *Dorymenia menchuescribanae*; C, D: *Sputoherpia galliciensis*. Abbreviations, Gl: gland; Go: gonad; Ht: Heart; Pc: pallial cavity; Pd: pericardioduct; Pr: pericardium; Rc: supra-rectal commisure; Re: rectum; Sd: spawning duct.

Figura 13. Microfotografías de cortes en sección del sistema reproductor. A: *Anamenia gorgonophila*; B: *Dorymenia menchuescribanae*; C, D: *Sputoherpia galliciensis*. Abreviaturas, Gl: glandula; Go: gónada; Hr: corazón; Pc: cavidad paleal; Pd: pericardioducto; Pr: pericardio; Rc: comisura suprarrectal; Re: recto; Sd: conducto de desove.

Genus *Epiherpia* Salvini-Plawen, 1997

Epiherpia Salvini-Plawen, 1997. *Journal of Molluscan Studies*, 63 (2): 151.

TYPE SPECIES: *Epimenia vixinsignis* Salvini-Plawen, 1978.

With epidermal papillae. Mouth within common atrio-buccal cavity. Ventral foregut glandular organs opening next to radula. Midgut with constrictions. Buccal ganglia typically

present. With dorsoterminal sense organ. Secondary genital opening unpaired. Seminal receptacles, copulatory stylets and respiratory organs unknown.

Epiherpia vixinsignis (Salvini-Plawen, 1978), in *Zoologica*, 44 (128)

Epimenia vixinsignis Salvini-Plawen, 1978

Holotype: Ross Sea (Antarctica); 659-714 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1997, in *J. Moll. Stud.*, 63.

Family SYNGENOHERPIIDAE Salvini-Plawen, 1978

Syngenoherpiidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 26.

Cuticle thick; hollow acicular sclerites arranged in several layers. Radula distichous to biserial. Ventral foregut glandular organs with a paired outlead-

ing duct, the intercellularly opening subepithelial gland cells being surrounded by an outer musculature (type B). Seminal receptacles in bundles.

Genus *Syngenoherpia* Salvini-Plawen, 1978

Syngenoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 284.

TYPE SPECIES: *Syngenoherpia intergenerica* Salvini-Plawen, 1978.

With epidermal papillae. Mouth within common atrio-buccal cavity. Midgut with regular constrictions. Sec-

ondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Syngenoherpia intergenerica Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: South Pacific; 567-604 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Syngenoherpia sanguicuneosa Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Balleny Islands (Antarctica); 1442-1444 m; Smithsonian Institution (Nat. Mus. Nat. Hist.), Washington DC, USA.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Family RHIPIDOHERPIIDAE Salvini-Plawen, 1978

Rhipidoherpiidae Salvini-Plawen, 1978. *Zoologica*, 44 (128): 26.

Cuticle thick; hollow acicular sclerites arranged in several layers. Radula polystichous. Ventral foregut glandular

organs with ducts and subepithelially arranged gland cells (type A). Seminal receptacles in bundles.

Genus *Rhipidoherpia* Salvini-Plawen, 1978

Rhipidoherpia Salvini-Plawen, 1978. *Zoologica*, 44 (128): 295.

TYPE SPECIES: *Rhipidoherpia copulobursata* Salvini-Plawen, 1978.

With epidermal papillae. Mouth within common atrio-buccal cavity. Midgut with regular constrictions. Sec-

ondary genital opening unpaired. With copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Rhipidoherpia copulobursata Salvini-Plawen, 1978, in *Zoologica*, 44 (128)

Holotype: Kerguelen Islands (Indian Ocean); 585 m; Station marine d'Endoume, Marseille, France.

Distribution: Kerguelen Islands, Crozet Islands (Indian Ocean); 187-585 m.

Literature: Salvini-Plawen, 1978, in *Zoologica*, 44 (128).

Genus *Thieleherpia* Salvini-Plawen, 2004

Thieleherpia Salvini-Plawen, 2004. *Journal of Molluscan Studies*, 70: 86.

TYPE SPECIES: *Thieleherpia thulensis* Thiele, 1900.

With epidermal papillae. Mouth within common atrio-buccal cavity. Midgut with regular constrictions. Secondary genital

opening unpaired. Without copulatory stylets. With dorsoterminal sense organ. Without respiratory organs.

Thieleherpia thulensis (Thiele, 1900), in *Fauna arctica*, 1

Proneomenia thulensis Thiele, 1900

Holotype: Hinlopen Strait, Spitzbergen (NE Atlantic); 480 m; Museum für Naturkunde, Berlin, Germany.

Literature: Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

Family NOTOMENIIDAE Salvini-Plawen, 2004

Notomeniidae Salvini-Plawen, 2004. *Journal of Molluscan Studies*, 70: 89.

Cuticle thick. Hollow club-shaped sclerites in one layer, generally not calcareous and with the internal space filled with a

matrix. Radula unknown. Ventral foregut glandular organs with ducts and subepithelially arranged gland cells (type A).

Genus *Notomenia* Thiele, 1897

Notomenia Thiele, 1897. *Zoologischer Anzeiger*, 20: 398.

TYPE SPECIES: *Notomenia clavigera* Thiele, 1897.

Epidermal papillae present. Mouth separated from the atrium. Radula missing. Midgut with constrictions. One pair of seminal receptacles.

Secondary genital opening paired. Without copulatory stylets. Dorsoterminal sense organ and respiratory organs unknown.

Notomenia clavigera Thiele, 1897, in *Zool. Anz.*, 20

Holotype: Torres Strait (N Australia); 36 m; Museum für Naturkunde, Berlin, Germany.

Distribution: North Australian and South Australian (Bass Strait) seas; 36–40 m.

Literature: Thiele, 1902, in *Zeitschr. wiss. Zool.*, 72. Salvini-Plawen, 2004, in *J. Moll. Stud.*, 70.

ACKNOWLEDGEMENTS

This paper is part of the research projects “DIVA-Artabria I” (Xunta de Galicia - PGIDT01PXI20008PR) and “DIVA-Artabria II” (M.E.C – Spanish government CTM-2004-00740). We are

grateful to Prof. Dr. Victoriano Urgorri at the University of Santiago de Compostela for his valuable help. Our thanks also to Ian Emmett for the English translation.

BIBLIOGRAPHY

- ARNOFSKY, P., 2000. *Spioenia spiculata*, gen. et sp. nov. (Aplacophora: Neomeniomorpha) collected from the Deep Waters of West European Basin. *The Veliger*, 43 (2): 110-117.
- BABA, K., 1938. The later development of a solenogastre, *Epimenia verrucosa* (Nierstrasz). *Journal of the Department of Agriculture, Fukuoka*, 6 (1): 21-40.
- BABA, K., 1940a. The mechanisms of absorption and excretion in a solenogastre, *Epimenia verrucosa* (Nierstrasz.). *Journal of the Department of Agriculture, Fukuoka*, 6 (4): 119-166.
- BABA, K., 1940b. The early development of the solenogastre, *Epimenia verrucosa* (Nierstrasz.). *Annotationes Zoologicae Japonenses*, 19 (2): 107-113.
- BABA, K., 1951. General sketches of development of a solenogastre, *Epimenia verrucosa* (Nierstrasz.). *Miscellaneous Reports of the Research Institute for Natural Resources, Japan*, 19-20: 38-46.
- GARCÍA-ÁLVAREZ, O., SALVINI-PLAWEN, L. v. AND URGORRI, V., 2001. The presence of *Simrothiella borealis* (Odhnner, 1921) (Mollusca, Solenogastres: Simrothiellidae) in waters off the Iberian Peninsula. *Iberus*, 19 (2): 1-8.
- GARCÍA-ÁLVAREZ, O., URGORRI, V. AND CRISTOBO, F. J., 2000. *Rhopalomenia aglaopheniae* (Kowalevsky y Marion, 1887) (Mollusca, Solenogastres, Rhopalomeniidae), presente en la costa norte de la Península Ibérica. *Iberus*, 18 (1): 125-131.
- GARCÍA-ÁLVAREZ, O., URGORRI, V. AND SALVINI-PLAWEN, L. v., 1998. *Dorymenia troncosoi* sp. nov. (Mollusca Solenogastres: Proneomeniidae), a new species from the South Shetland Islands (Antarctica). *Polar Biology*, 20: 382-387.
- HANDL, C., 2002. *Imerohierpia laubieri*, a new solenogaster from the Bay of Biscay. *Journal of Molluscan Studies*, 68: 329-335.
- HANDL, C. AND SALVINI-PLAWEN, L. v., 2001. New records of Solenogastres-Pholidoskepia (Mollusca) from Norwegian fjords and shelf waters including two new species. *Sarsia*, 86: 367-381.
- HANDL, C. AND TODT, CH., 2005. Foregut glands of Solenogastres (Mollusca): Anatomy and revised terminology. *Journal of Morphology*, 265: 28-42.
- HEATH, H., 1904a. The nervous system and subradular organ in two genera of Solenogastres. *Zoologische Jahrbücher. Abteilung für Anatomie und Ontogenie der Tiere*, 20: 399-408.
- HEATH, H., 1904b. The habits of a few Solenogastres. *Zoologischer Anzeiger*, 27: 457-461.
- HEATH, H., 1905. The morphology of a Solenogastre. *Zoologische Jahrbücher. Abteilung für Anatomie und Ontogenie der Tiere*, 21 (4): 701-734.
- HEATH, H., 1908. The Solenogastre subradular nervous system. *Anatomischer Anzeiger*, 33: 365-367.
- HEATH, H., 1914. Certain features of Solenogastre development. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 66: 535-541.
- HOFFMAN, S., 1947/1949. Studien über das Integument der Solenogastren nebst Bemerkungen über die Verwandtschaft zwischen den Solenogastren und Placophoren. *Zoologiska Bidrag från Uppsala*, 27: 293-427.
- HOFFMANN, H., 1929-1930. Aplacophora. In: *Klassen und Ordnungen des Tierreichs*, 3 (1) H.G. Bronn (ed.) (Nachtr. I and II): 1-368.
- LELOUP, E., 1950. Solenogastres provenant des Campagnes du Prince Albert Ier de Monaco. *Résultats des campagnes scientifiques accomplies sur son yacht par Albert Ier, Prince souverain de Monaco*, 110: 1-37.
- NIERSTRASZ, H., 1902. The Solenogastres of the Siboga Expedition. *Siboga Expedition, Monograph* 47: 1-46.
- NIERSTRASZ, H. F., 1905. *Kruppomenia minima* und die Radula der Solenogastren. *Zoologische Jahrbücher. Abteilung für Anatomie und Ontogenie der Tiere*, 21: 665-702.
- NIERSTRASZ, H., 1908. The Solenogastres of Discovery-Expedition. *National Antarctic Expedition 1901-1904, Natural History*, 4: 38-46.
- NIERSTRASZ, H., 1909. Die Amphineuren. I. Die Solenogastren. *Ergebnisse und Fortschritte der Zoologie*, 1: 239-306.
- PELSENEER, P., 1903. Zoologie: Mollusques (Amphineures, Gastropodes et Lamellibranches). *Résultats du Voyage du S.Y. Belgica en 1897-1898-1899 sous le commandement de A. de Gerlache de Gomery: Rapports Scientifiques* (1901-1913), 14: 1-85, pl. 1-9. Buschmann: Anvers.
- PRUVOT, G., 1890a. Sur le développement d'un Solenogastre. *Comptes rendus hebdomadaires des séances de l'Académie des Sciences*, 111: 689-692.
- PRUVOT, G., 1890b. Sur le prétendu appareil circulatoire et les organes génitaux des Néoméniées. *Comptes rendus hebdomadaires des séances de l'Académie des Sciences*, 111: 59-62.
- PRUVOT, G., 1892. Sur l'embryogénie d'une *Proneomenia*. *Comptes rendus hebdomadaires des séances de l'Académie des Sciences*, 114: 1211-1214.

- SALVINI-PLAWEN, L. v., 1967. Kritische Bemerkungen zum System der Solenogastres (Mollusca, Aculifera). *Zeitschrift für Zoologische Systematik und Evolutionforschung*, 5 (4): 398-444.
- SALVINI-PLAWEN, L. v., 1971. Schild- und Furchenfüßer (Caudofoveata und Solenogastres). *Die Neue Brehm-Bucherei*, 441: 1-95.
- SALVINI-PLAWEN, L. v., 1972a. Zur Morphologie und Phylogenie der Mollusken: Die Beziehungen der Caudofoveata und der Solenogastres als Aculifera, als Mollusca und als Spiralia. *Zeitschrift für wissenschaftliche Zoologie*, 184 (3/4): 205-394.
- SALVINI-PLAWEN, L. v., 1972b. Revision der monogastischen Solenogastres (Mollusca, Aculifera). *Zeitschrift für Zoologische Systematik und Evolutionforschung*, 10 (3): 215-240.
- SALVINI-PLAWEN, L. v., 1978. Antarktische und subantarktische Solenogastres Eine Monographie: 1898-1974. *Zoologica (Stuttgart)*, 44 (128): 1-315.
- SALVINI-PLAWEN, L. v., 1985. Early evolution and the primitive groups. In: *The Mollusca*. (E.R. Trueman and M.R. Clark., Acad. Press, Inc. Orlando) 10 (Evolution): 59-150.
- SALVINI-PLAWEN, L. v., 2003a. On the phylogenetic significance of the aplacophoran Mollusca. *Iberus*, 21 (1): 67-97.
- SALVINI-PLAWEN, L. v., 2003b. Contributions to West-Mediterranean Solenogastres (Mollusca) with three new species. *Iberus*, 21 (2): 37-60.
- SCHELTEMA, A., 1988. Ancestors and descendants: relationships of the Aplacophora and Polyplacophora. *American Malacological Bulletin*, 6: 57-68.
- SCHELTEMA, A., 1993. Aplacophora as progenetic aculiferans and the coelomate origin of mollusks as the sister taxon of Sipuncula. *Biological Bulletin*, 184 (1): 57-78.
- SCHELTEMA, A., 1999. New eastern Atlantic neomeniid aplacophoran molluscs (Neomeniomorpha, Aplacophora). *Ophelia*, 51: 1-28.
- SCHELTEMA, A. AND SCHANDER, CH., 2000. Discrimination and phylogeny of Solenogaster species through the morphology of hard parts (Mollusca, Aplacophora, Neomeniomorpha). *Biological Bulletin*, 198: 121-151.
- SCHELTEMA, A. TSECHERKASSKY, M. AND KUZIRIAN, A. M., 1994. Aplacophora. In: *Microscopic Anatomy of Invertebrates*, 5: Mollusca Y. Wiley-Liss, Inc: 13-54.
- SCHWABL, M., 1963. Solenogastres mollusks from southern California. *Pacific Science*, 17 (3): 261-181.
- SIMROTH, H., 1893. Aplacophora. In Bronn, H. G. (Ed.): *Klassen und Ordnungen des Tierreichs*, III (1): 97-240.
- THIELE, J., 1894. Beiträge zur vergleichenden Anatomie der Amphineuren: I. Ueber einige neapeler Solenogastres. *Zeitschrift für wissenschaftliche Zoologie*, 58 (2): 222-302.
- THIELE, J., 1902. *Proneomenia valdivia* n. sp. *Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898-1899*, 3: 167-174.
- THIELE, J., 1906. *Archaeomenia prisca* n. g. n. sp. *Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898-1899*, 9: 317-324.
- THIELE, J., 1911. Die Solenogastres der russischen Polar-Expedition 1900-1903. *Mémoires de l'Académie impériale des Sciences St. Pétersbourg, sér. 8, classe physico-mathématique*, 29 (5): 1-61.
- THIELE, J., 1913a. Antarktische Solenogastren. *Deutsche Südpolar-Expedition 1901-1903*, 14 (Zool., 6) (1): 35-65.
- THIELE, J., 1913b. *Solenogastres*. Das Tierreich, 38 (I-X): 1-57.
- THIELE, J., 1932. Die Solenogastres des arktischen Gebietes. *Fauna Arctica*, Römer and Schaudinn, 6 (IV): 379-382.
- THOMPSON, T. E., 1960. The development of *Neomenia carinata* Tullberg (Mollusca Aplacophora). *Proceedings of the Royal Society of London, Ser B*, 153: 263-278.
- TODT, C. AND SALVINI-PLAWEN, L. v., 2003. New Simrothiellidae (Mollusca: Solenogastres) from the Mozambique Channel, Western Indian Ocean. *The Veliger*, 46 (3): 252-266.
- TULLBERG, T., 1875. *Neomenia*, a new genus of invertebrate animals. *Kungliga Svenska Vetenskaps-Akademiens Handlingar*, 3: 1-12, pl. 1-2.
- WOLTER, K., 1992. Ultrastructure of the radula apparatus in some species of aplacophoran molluscs. *Journal of Molluscan Studies*, 58: 245-256.